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USSR Report

SCIENCE AND TECHNOLOGY POLICY

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CONTENTS

ROLE OF PARTY ORGANIZATIONS IN INTEGRATING SCIENCE AND PRODUCTION

Moscow VOPROSY ISTORII KPSS in Russian No 9, Sep 83 pp 77-87

[Article by G. I. Chernyshev: "Party Organizations and the Process of Integrating Science and Production"]

[Text] The development of the Soviet economy at the contemporary stage is tied directly to the great scientific and technical revolution, and to the fundamental, qualitative transformation of productive forces through turning science into a leading factor in national production. We are, in essence, witnesses and contemporaries of a new stage in that process, the beginning of which was noted by Karl Marx: "...The scientific factor is for the first time being consciously and broadly developed, it is being applied and called into being on a scale that previous epochs could not even imagine"[1].

In working out a plan for the construction of a socialist society, V. I. Lenin devoted a great deal of attention to developing science in every way possible and to organizing science on a statewide scale. He constantly emphasized that the only material foundation for socialism is large scale machine industry that is based on the latest scientific achievements[2].

The CPSU, guided by Marxist-Leninist teachings, has been following a steady course directed at uniting science and production. One of the characteristic features in the activity of party organizations under the conditions of a developed socialist society is intensification of the organizational work directed at increasing production efficiency and stepping up scientific and technical progress. The Report to the 26th CPSU Congress states that "close integration of science and production is an imperative demand of the contemporary epoch"[3].

At the June (1983) Plenum of the CPSU Central Committee, Yu. V. Andropov, general secretary of the CPSU Central Committee, spoke of the need "to ensure the most rational use of the country's production and scientific and technical potential"[4].

Certain difficulties are being encountered in utilizing this reserve, however. There are still remnants of attitudes and methods from the stage of extensive development of science, which emerged during the years when its budget and personnel were growing faster than the economy. As Yu. V. Andropov pointed out, there are still problems in putting scientific and technical ideas into

practice which are also linked to the lack of an incentive system for modernizing equipment and manufacturing processes. As a result of this, industrial executives who take risks on innovations often end up losing, while those who avoid innovations lose nothing[4a].

Researchers are focusing more and more attention on questions involving accelerated scientific and technical progress.

Soviet scholars (mainly economists and philosophers) have worked out various aspects of integrating science and production[5], with primary emphasis being placed on improving the management of this process[6].

Social scientists have also started to discuss in more depth the role of the Communist Party in the development of science and technology. Major studies of a general nature have appeared that examine the problems of party leadership in scientific and technical progress and analyze the social consequences of the scientific and technical revolution[7].

Not enough attention, however, is being paid in historical party research to forms and methods of party leadership in the integration of science and production, such as the development of a long-range program for scientific and technical progress; comprehensive plans for the economic and social development of enterprises, rayons, and regions; improved management of science through the organization of scientific centers; formation of production and scientific production associations; party committee activities at public institutes that promote scientific and technical progress; and organizing and conducting scientific and practical conferences. A number of regions in the country have gained a considerable amount of instructive experience in solving these problems and it would be useful to disseminate this experience.

In this article we will attempt to summarize several aspects of party organizations' activity in managing the integration of science and production under the conditions of developed socialism; to explain the significance of the measures taken by the party to develop a comprehensive program for scientific and technical progress; and to discuss various initiatives taken by local CPSU organs in the search for effective forms of uniting science and production.

The development of our society at the stage of developed socialism and under the conditions of the spreading scientific and technical revolution required improved methods for an integrated, systematic resolution of all the problems involved in economic, social, and scientific and technical progress and improved long-range planning. As Yu. V. Andropov stressed, in this situation a unified science and technology policy plays a decisive role[7a].

Proceeding from these objective requirements, the CPSU Central Committee and the Soviet government recognized that along with many other measures, it is important to develop 10-15 year scientific and technical forecasts for the most important directions in the development of the national economy.

The joint decree issued by the CPSU Central Committee and the USSR Council of Ministers on 5 March 1963 "On Further Improvements in Managing the Development of Science and Technology in the Country" points out the special importance of

providing a unified state policy for combining science and production and of working out intersectorial and multi-dimensional scientific and technical problems. The decree stipulates, in particular, that the basic directions of research tied to solving the most important multi-dimensional and intersectorial scientific and technical problems should be outlined for the next few years and for a longer period (10-20 years). These problems primarily involve the development of the most promising and rapidly growing branches of science and technology, increasing the amount of work done by scientific research and planning and design organizations, and reducing the amount of time required to incorporate scientific ideas into the national economy[8].

The CPSU Central Committee and the USSR Council of Ministers have assigned the USSR Academy of Sciences and the USSR State Committee for Science and Technology, together with ministries and departments, the task of preparing a draft of a Comprehensive Program for Scientific and Technical Progress and its long-term social and economic consequences.

In carrying out these directives, in 1979 the USSR Academy of Sciences and the State Committee for Science and Technology completed a draft of the Comprehensive Program for Scientific and Technical Progress up to the Year 2000.

The scale of this creative undertaking is evidenced by the fact that 2000 specialists and 30 working groups and commissions participated in the work; they represented more than 500 scientific research and planning and design organizations. On the basis of the conclusions and recommendations contained in the Comprehensive Program, suggestions were made for the Basic Directions of Economic and Social Development in the USSR for 1981-1985 and for the period up to 1990, that touch on the development of technology and organization of production[9].

The comprehensive program was worked out in 16 scientific and technical directions and 11 social and economic directions. Academician V. A. Kotel'nikov noted that the basic conclusion resulting from the work that was done is that the scientific and technical work in progress in the country, if utilized properly, can help resolve the primary social and economic problems of the current decade[10].

In his speech at the June (1983) Plenum, Yu. V. Andropov, general secretary of the CPSU Central Committee, pointed out that the main way to make a qualitative shift in the country's productive forces is to make a transition to intensive development of these forces, and to "combine in practice the advantages of our socialist system with the achievements of the scientific and technical revolution"[11].

The 26th CPSU Congress proposed that there be further development and realization of the Comprehensive Program for Scientific and Technical Progress, as well as the special programs for resolving scientific and technical problems. The "Basic Directions for Economic and Social Development in the USSR for 1981-1985 and up to the Year 1990" for the first time includes a section on "The Development of Science and Accelerating Scientific and Technical Progress", which outlines specific goals in the area of fundamental

and applied research, and social, natural and technical sciences, that stem from the Comprehensive Program[12].

The directives of the Congress were put into more concrete terms in subsequent decisions issued by the party and the government, especially in the documents of the May and November (1982) and June (1983) Plenums of the CPSU Central Committee. The various propositions involving improvements in the agro-industrial complex were clarified in the decree issued by the CPSU Central Committee and the USSR Council of Ministers "On Measures for Further Improvements in the Technical Level and Quality of Agricultural Machinery and Equipment, for Improving its Utilization, and Increasing Production and Supply between 1983 and 1990". The decree calls for measures for comprehensive mechanization of primary and ancillary operations, incorporation of industrial processing methods, and maximum reduction in losses of agricultural production[13].

During the 8th and 9th Five-Year Plans, at the initiative of party organizations, comprehensive planning of economic and social development on the basis of accelerated scientific and technical progress was also implemented at individual enterprises. The development and fulfillment of the first plan of this type--at the "Svetlana" scientific production association--provided a 12.7 percent increase in the average annual growth in production output. The technical indicators for four-fifths of the production output reached or exceeded the level of the best Soviet models. Comprehensive plans for technical, economic, and social development were developed at all the primary enterprises in Leningrad for 1971-1975. These plans helped incorporate scientific and technical achievements into production, they promoted scientific organization of labor, improved production management, and raised the cultural, technical, and general educational level of the workers[14].

Similar plans for the 9th Five-Year Plan and beyond have been and are being developed in Moscow, the Urals, Siberia, and other industrial centers. Party organs were responsible for managing the dissemination of this experience. In April 1969 the bureau of the Moscow city party committee approved the practice of social planning at Clock Factory No 1. Recommendations were made to rayon party committees, party committees, party bureaus, party organizations, and managers of the capital's enterprises to make use of this experience. In 1970, 300 enterprises in Moscow had plans for social development; in 1974, over 700 enterprises and institutions had plans of this nature[15].

The plenum of the Sverdlovsk Oblast party committee in June 1970 had an important impact on introducing long-range comprehensive plans for technical progress and social development in collectives in Sverdlovsk Oblast; this plenum approved the work being done in this direction at the Pneumatic Construction Machinery Plant, the Instrument Plant, the Turbine Engine Plant, the Ural Heavy Electrical Equipment Plant (in Sverdlovsk), the Nizhniy Tagil Plastics Plant, and elsewhere[16].

The experience in technical, economic, and social planning for enterprises and associations has been used in developing comprehensive plans for the economic and social development of rayons, cities, and oblasts. Rayon party committees in Moscow started planning the social development of their rayons at the

beginning of the 1970s. In 1972 plans of this nature were discussed and adopted in Zhdanovskiy, Baumanskiy, Perovskiy, and other rayons in Moscow. By the beginning of the 10th Five-Year Plan all the rayons and the overwhelming majority of the enterprises and institutions in the capital had adopted plans of this type[17].

The comprehensive plan for social development adopted by the Leningrad rayon party committee and the executive committee of the rayon Council of People's Deputies, for example, consisted of the following sections: technical and economic development of the rayon as a basis for social transformations; improvement of working conditions at enterprises, organizations, and institutions; changes in the social structure of the population and improving the workers' skills; improving the people's standard of living; reinforcing the communist education of the workers; measures to ensure fulfillment of the social development plan and to exercise control over its fulfillment.

Departments and services of the rayon party committee and the rayon soviet executive committee, social and administrative organs, and the council for planning the rayon's social development under the rayon party committee all exercise control over plan fulfillment. Groups to help fulfill the plan have been formed and are operating in microrayons. They are under the direction of chief party and soviet personnel[18].

The preparation of documents of this nature is not only a labor-intensive operation, it is a complex task that requires specialized knowledge. It is no coincidence, for example, that the Sverdlovsk city party committee, in initiating the development of a long-range comprehensive plan to develop industry and other economic sectors in the city between 1971 and 1980, included 20 scientific research institutes in the project[19].

Guided by the decisions of the CPSU and utilizing the accumulated experience, party committees were responsible for working out long-range comprehensive plans for regional development. The Moscow city party committee formed a special commission which was made up of party and soviet personnel, managers, production workers, and scientists. As a result, a draft was developed for the basic directions of Moscow's social and economic development for 1976-1990; this draft was discussed and approved by a plenum of the Moscow city party committee in March 1975[20]. This document, in the words of V. V. Grishin, member of the Politburo of the CPSU Central Committee and first secretary of the Moscow city party committee, defines the city as it will appear on the threshold of the third millenium. The important, integral parts of this multifaceted, long-range plan were put into specific terms in the "Comprehensive Special Program for the Development of Moscow Industry between 1981 and 1990", which was developed at the initiative of the city party committee. This program calls for unsurpassed growth in sectors that determine technical progress and provide reconstruction and modernization of industry and transportation[21].

The Sverdlovsk Oblast party committee was one of the first in the country to work out a long-range comprehensive plan for an oblast's social and economic development up to 1990. It enlisted the help of 115 scientific research and planning institutes and VUZes, and over 200 industrial enterprises to help

carry out this task. At the initiative of party organizations, scholars at the Ural Scientific Center of the USSR Academy of Sciences formed a long-range comprehensive plan for the development of the Ural economic region up to 1990[22].

The CPSU assigns great importance to the all-round development of regional productive forces. The decree issued by the CPSU Central Committee on 27 January 1977 concerning the activity of the Siberian Department of the USSR Academy of Sciences recommends that the department's scientists play a more active role in working out programs for the comprehensive development of Siberian regions.

Between 1977 and 1978 in all the oblast and kray centers of Siberia and in the Yakutsk and Buryat Autonomous Republics, expanded party management meetings were held; local party and soviet organs and members of the scientific and technical community discussed the most pressing problems in the development of each region. Participating in the discussions were leaders of krays and oblasts, industrial and agricultural associations, and geological administrations, scholars from the USSR Academy of Sciences, the Academy of Agricultural Sciences imeni V. I. Lenin, the USSR Academy of Medical Sciences, industrial scientific research institutes, and higher education institutions.

The formation and realization of the "Sibir'" [Siberia] long-range program is a characteristic example of the integration of science and production that is possible only under conditions of a developed socialist society and the scientific and technical revolution.

One of the most important links in the "science-technology-production" system is making the transition from scientific discovery into the sphere of physical production, since as K. Marx pointed out, "a product...becomes a product only in consumption"[23] (Marx clearly meant consumption in production). Science's high degree of effectiveness is seen in the final analysis in the cardinal changes that occur in production through the incorporation of major scientific ideas.

Effective forms of integrating science and production, such as the scientific production association, contribute to this high degree of effectiveness. The CPSU Central Committee and the USSR Council of Ministers pointed out the advisability of creating associations of this nature in the decree adopted on 24 September 1968 "On Measures to Increase the Effectiveness of Scientific Organizations and Step Up the Utilization of Scientific and Technical Achievements in the National Economy"[24].

The measures worked out and implemented by the party and the Soviet government for forming scientific production associations are, in essence, the embodiment of Marx's ideas that "the experience of combined work reveals and demonstrates where and how one should economize, how to make the easiest use of discoveries that have already been made, and what practical obstacles need to be overcome when following the theory's demands and applying the theory to the production process..."[25]. V. I. Lenin, in the "Outline of a Plan for Scientific and Technical Work" from April 1918, also established the principles of combining science and the development of productive forces, and also with an upswing in

the country's economy and a rise in the state's control over science. In the union of science, technology, and production, he saw a real opportunity for the country's economic transformation[26].

The need to overcome the gap that still exists between a number of scientific and technical organizations and production enterprises stems from these positions taken by Marx and Lenin. In the final analysis, this gap gives rise to unwarranted delays in the process of planning new machinery, instruments, and equipment, and in developing series production of these articles, and to a low level of effectiveness in many developments. As was noted at the 24th CPSU Congress, this is the source of weakness in links tied "to the practical realization of scientific achievements and their incorporation into mass production"[27]. The organization and development of scientific production associations is one of the ways to eliminate this weakness.

In putting the party's decisions into practice, local CPSU organs are consistently and persistently pursuing a policy directed at organizing scientific production associations. The October 1969 plenum of the Moscow city party committee was an important step in this direction; it examined the question of the Moscow party organization's work to step up the rate of scientific and technical progress by concentrating industrial production[28].

In accordance with the plan worked out at the plenum, the process of concentration and specialization of production is being accelerated; during the 8th Five-Year Plan the first production and scientific production associations were formed. By the end of 1975 there were already 108 associations in the capital, which included more than 400 enterprises and scientific research organizations[29]. By 1981 the number of production and scientific production associations in Moscow had reached 184[30].

The Leningrad party organization did some serious preparatory work to help form the first production associations. The oblast, city, and rayon party committees made an in-depth study of the state of affairs in industry, the nature of production, and the existing ties among the majority of enterprises; they were then able to determine the possibilities for mergers among the enterprises and the main ways to improve the structure and organization of production and management. The proposals that were prepared were examined carefully by industrial departments of the oblast party committee and they were discussed at a meeting of the oblast party committee secretariat with the participation of managers and secretaries of party organizations from the associated enterprises. The decisions made by the bureau of the oblast party committee, after studying the initial experience of the Optical Mechanics Association and the "Svetlana" association, played an important role in determining paths for further concentration of industry and the main principles in organizing production and management in associations. The discussion held in 1970 by the CPSU Central Committee on the oblast party committee's report concerning the creation of production associations was of immense importance[31].

All this work had positive results. In 1965 Leningrad industry had 27 associations which included 120 enterprises; in 1970 there were 56 associations. During the 9th Five-Year Plan 54 production and scientific production associations were formed in addition to 22 consolidated plants and

factories. At the end of 1975 there were 110 associations in operation which included 483 enterprises, 136 of which were outside the boundaries of Leningrad Oblast; this also included 109 scientific research institutes and design bureaus. In 1965, 15.6 percent of Leningrad Oblast's total industrial output was produced at enterprises that were members of associations; in 1976 this figure had gone above 50 percent[32].

The Sverdlovsk, Novosibirsk, Kiev, Lvov, and Gorkiy oblast party committees and party organs in other industrial centers are doing a great deal to help form associations and improve their operation. As a result of this work the number of scientific production associations is growing, as is their role in the country's economy. In 1983 there were 4083 production and scientific production associations in operation, compared to 608 in 1976; they were responsible for 48.2 percent of the total domestic industrial output (in 1970 this figure was 6.7 percent)[33].

The process of forming scientific production associations was stepped up considerably through the realization of general models for improving the management of various sectors of industry; these models were developed in accordance with the decree issued by the CPSU Central Committee and the USSR Council of Ministers "On Measures for Further Improvement in the Management of Industry". The statute on scientific production associations confirmed by the USSR Council of Ministers on 30 December 1975 is promoting an expansion of the network of scientific production associations, and it is helping to strengthen them and to promote their further development. By the end of the 11th Five-Year Plan there were over 250 scientific production associations in the national economy.

Practical experience has provided convincing evidence that scientific production associations have long-range prospects and are highly effective; scientific research institutes play a leading role in these associations. During the 9th Five-Year Plan industrial enterprises obtained an annual economic effect of 10 million rubles as a result of incorporating developments worked out by the "Kompleks" [Complex] Association. New equipment produced by this association made it possible to free up 35,000 transportation and warehouse workers[35].

During the first four years of the 10th Five-Year Plan alone, the "Elva" Scientific Production Association (which includes the Tbilisi Instrument Building and Means of Automation Scientific Research Institute, an experimental plant, and a control computer plant) managed to double labor productivity, and the products list was revised completely[36].

The experience of the "Enims" [Metal Cutting Lathe Experimental Scientific Research Institute], "Pozitron" [Positron], "Plastpolimer" [Plastic Polymer], "Neftekhim" [Petrochemical], and many other scientific production associations, has demonstrated that with the organization of these associations there was a sharp rise in the number of developments incorporated into production, the time spent creating new equipment was reduced to one-half to one-third of the previous time period, product quality improved, and the technical and economic indicators of the products rose. Thanks to the combined planning approach that is taken in scientific production associations, the "research-production" cycle

is stepped up significantly by eliminating interruptions between various stages and duplication of various operations[37].

Characteristically, the USSR's experience in creating scientific production associations has been applied in other countries of socialist cooperation; in Bulgaria, for example, one-fifth of all the scientists are members of scientific production associations[38].

The immense potential possibilities of scientific production associations are not being fully utilized in the country's national economy, however. Serious shortcomings in planning, financing, and labor incentives are hindering the associations' activities. A number of ministries, departments, enterprises, and scientific research institutes that are included in associations are preserving their legal independence[39]. These shortcomings were pointed out in the decree issued by the CPSU Central Committee and the USSR Council of Ministers on 12 July 1979 "On Improved Planning and Increasing the Effect of the Economic Mechanism on Raising Production Efficiency and Work Quality". Nonetheless, these problems are being eliminated slowly.

There are still major reserves for reducing the time spent on incorporating science into production and for increasing the production of new technical equipment in the future development and improvement of scientific production associations. The following statement was made at the 26th CPSU Congress: "The decisive, most important sector today is the incorporation of scientific discoveries and inventions. Scientific research and planning and design work should be coordinated more closely, both economically and organizationally, with production"[40] Scientific productions associations should play an important role in achieving this goal.

Public institutes attached to party committees, scientific and technical councils, commissions for stepping up scientific and technical progress, technical and economic councils, and other groups, also contribute to the integration of science and production. Their primary task is to develop recommendations for and provide assistance to collectives at industrial enterprises in stepping up scientific and technical progress.

For example, in the Moscow city party committee this function is performed by a permanent commission for the city's social and economic development, which consists of party and soviet personnel, managers, scientists, and specialists. The commission monitors plan fulfillment, outlines ways to reslove problems that arise, and it works out appropriate measures for stepping up scientific and technical progress. All the rayon party committees in Moscow also have active technical and economic councils that are made up of scientists, specialists in various sectors of the national economy, managers of enterprises, innovators, outstanding production workers, inventors, rationalizers, and representatives of party and trade union organizations[41]. These councils are one of the forms of organizational work being done by the rayon party committees to strengthen creative cooperation among scientists and production workers. They provide practical assistance to enterprises in preparing and carrying out measures to step up scientific and technical progress, to raise production efficiency and improve product quality; they

analyze the results of their work in this direction and they help spread the methods used by outstanding workers.

In addition to the technical and economic councils, there are other public institutes formed under Moscow rayon party committees that promote the integration of science and production. For example, under the Sverdlovsk rayon party committee in Moscow there is a public science council made up of scientists, chief engineers at enterprises, and designers. It provides assistance to the rayon's scientific institutions and higher education institutions in incorporating effective research methods and strengthening their ties with the appropriate sectors of industry. The rayon party committee reviews the recommendations made by the public council and organizes control over their fulfillment[42].

The Brezhnevskiy rayon party committee has three volunteer councils--a methodology council, a science council, and a technical and economic council. These councils unite 450 highly skilled specialists. Through these councils the rayon party committee carries out measures directed at making further improvements in the work of scientific institutions and, first and foremost, at expanding the scope of physical applications for science and turning science into a direct productive force. These measures are having positive results. The number of scientific developments incorporated into production annually by the rayon's scientific research institutes and design bureaus increased by a factor of 1.5 just during the first two years of the 10th Five-Year Plan. A total of 750 patents were issued for inventions, which is about one-half the total number issued during the entire 9th Five-Year Plan[43].

The council for promoting scientific, technical, social, and economic progress under the Novosibirsk Oblast party committee is operating effectively; the head of the council is one of the secretaries of the party committee. The council devotes most of its attention to developing and strengthening creative ties between institutes of the Siberian Department of the USSR Academy of Sciences and plants in Novosibirsk and throughout the oblast. It coordinates the work of the commissions for promoting the acceleration of scientific and technical progress and the technical and economic councils under city and rayon party committees in Novosibirsk Oblast. These organizations provide assistance to scientific institutions and enterprises in incorporating scientific achievements into production, and they summarize and disseminate advanced methods. In 1981 in Novosibirsk there were more than 8000 sections, committees, laboratories, economic analysis bureaus and groups, creative brigades, and councils for the scientific organization of labor, employing over 42,000 people. During the 10th Five-Year Plan, through the efforts of the public creative units in just one oblast center, 63,000 specific proposals were developed for stepping up scientific and technical progress in all sectors of the oblast's economy[44].

Local party organizations are utilizing scientific conferences as a way to direct the incorporation of scientific and technical achievements into production. These conferences cover a vast geographical area. It is sufficient, however, to describe the general principles behind them by looking at the experience of party organizations in Moscow and the Urals, which have been holding many of these conferences since the middle of the 1960s. In

May 1972 the Moscow city party committee, in conjunction with the USSR State Committee for Standards, held a scientific and technical conference. At the conference the results of Moscow industry's campaign for product quality were summarized and specific measures directed at fulfilling the decisions of the 24th CPSU Congress were outlined.

The conference was carefully prepared in accordance with a plan confirmed by the Moscow city party committee. An exhibit was set up in the Pavilion of Standards at the Exhibition of USSR National Economic Achievements; the exhibit was devoted to "The Experience of Moscow's Enterprises in Improving Product Quality". Eighty-nine of Moscow's enterprises participated in the exhibit. More than 400,000 people visited the exhibit and saw samples of the enterprises' products. About 1500 excursions were organized for 45,000 specialists from the Soviet Union and abroad.

Many meetings and seminars were held at the exhibit, in addition to gatherings for the outstanding production workers from a number of different industrial sectors. There were 30 rayon party committees that held meetings here of their party and management members[45].

Topical materials were published regularly in central and Moscow newspapers, with titles such as "The Moscow Trademark", "A School for Top Quality", "Industry as Teacher", "Quality at the Testing Benches", and so on. There were radio and television broadcasts propagandizing advanced methods, and the Polytechnical Museum held regular tutorials on various issues in the campaign for product quality.

These measures (only a few of which have been described here) helped draw the capital's scientific and technical community into the conference preparations and into direct participation in the conference.

During the course of the conference itself 2 plenary meetings were held in addition to 5 sectorial, topical sections; 3200 specialists participated in these meetings and 52 papers were presented at the sections[46].

In mobilizing Muscovites toward successful fulfillment of the 10th Five-Year Plan, the Moscow city party committee held a scientific and practical conference in July 1977 on "Basic Directions for Increasing Efficiency and Work Quality at Industrial Enterprises in Moscow in Light of the Demands Issued by the 25th CPSU Congress". In contrast to earlier conferences, this conference was distinguished by a qualitatively new approach to the development of the capital's economy. It examined not one, as had been done before, but a number of problems: increasing the efficiency of national production and scientific research, stepping up the rate of scientific and technical progress, the production of articles that exceed the best domestic and world models, and extensive incorporation of research results into the national economy. V. V. Grishin, member of the Politburo of the CPSU Central Committee and first secretary of the Moscow city party committee, participated in the conference along with officials from the USSR State Planning Committee, the State Committee for Standards, and the State Committee for Labor under the RSFSR Council of Ministers.

The conference worked out extensive recommendations at the plenary meeting and the five sections, where 49 reports were heard from representatives of industry, scientific research institutes, design bureaus, party, trade union, and Komsomol organizations. Fulfillment of these recommendations contributed to the Muscovites' successful completion of the 10th Five-Year Plan. The volume of industrial production in the capital increased by 21 percent compared to the 1971-1975 level. In 1980 the entire increase in production was achieved through an increase in labor productivity. Moscow's scientists completed approximately 120,000 research projects and developments with an economic effect of 12 billion rubles[47]. The production of top quality goods increased by a factor of 2.6 and accounted for 23 percent of the total production output. More than 5500 of these products carry the state emblem of quality and a citywide system of quality control has been created and is being put into practice[48].

The experience of the Sverdlovsk Oblast party committee is also instructive. In 1965 it held a scientific and production conference; representatives of party, soviet, trade union, and Komsomol organizations, managers and specialists from industrial enterprises in the Central Urals, and scientists participated in conference. The conference participants worked out a program for scientific research for 1966-1970 that was directed at stepping up technical progress in the oblast's industry; it outlined 926 different measures. Thanks to constant monitoring on the part of city and rayon party committees and primary party organizations, by September 1970 756 measures had been carried out with an annual economic effect of 418 million rubles[49].

Near the end of the 8th Five-Year Plan (October 1970), the Sverdlovsk Oblast party committee convened a scientific and practical conference on utilizing scientific and technical achievements in the oblast's economy.

Thorough preparations preceded the conference: the bureau of the oblast party committee discussed the issue specifically and outlined an agenda and program for the conference. Participating in the conference were secretaries of city party committees, rayon party committees, party committees of major enterprises and institutes, managers, specialists, innovators in industry and transportation, scientists, and representatives of soviet, trade union, and Komsomol organs. At the plenary meeting the first secretary of the oblast party committee presented a report "On the tasks facing collectives of the oblast's industrial and transport enterprises and scientific research institutes in incorporating scientific and technical achievements into production". There were 2780 people participating in the 11 industrial sections, and in sections on fundamental scientific research and intersectorial, multi-dimensional problems; they included scientists, engineering and technical personnel, production innovators, rationalizers, and inventors. A total of 240 reports and communications were presented at the plenary meeting and sections.

The conference approved the recommendations presented by the sections on incorporating scientific and technical achievements into industry and transportation; these recommendations included 1600 different measures directed at intensifying production processes, incorporating progressive manufacturing methods, improving product quality, and mechanization and automation of primary

and ancillary production. Realization of the measures outlined at the conference provided an annual savings in the oblast's economy of 600 million rubles[50].

The Sverdlovsk Oblast party committee started holding scientific and practical conferences on a regular basis. As B. N. Yel'tsin, first secretary of the oblast party committee, pointed out in his speech to the 26th CPSU Congress, these oblast scientific and practical conferences, in which practically all the collectives participate, consider plans for incorporating the results of scientific work into production. The conference's recommendations that were put into practice during the 10th Five-Year Plan were qualitatively different because they included major special comprehensive programs that were carried out according to the unified plans of several scientific and production collectives. The programs were aimed at solving the most important sectorial and intersectorial problems, such as mechanization of heavy manual labor, rational utilization and conservation of fuel, electrical power, and ferrous metals, renovation of enterprises, and so on. All this made it possible for the oblast's workers to obtain an economic effect of approximately 2 billion rubles during the 10th Five-Year Plan from incorporating scientific and technical achievements. Increased labor productivity was responsible for more than 96 percent of the growth in production output[51].

As evidenced in the experience of Moscow, Sverdlovsk, and other regions, conferences are one of the most effective forms of organizational work of local party organs for carrying out the science and technology policy of the CPSU.

The specific features and effectiveness of this and other forms of party management of the integration of science, technology, and production still have not been reflected adequately in the literature; this is to a certain extent hindering further improvements in the work being done by party committees and organizations in this direction. It seems to us that there are considerable resources for making improvements. This problem should be given special attention. In this article, the subject of which was positive experience, we have limited ourselves to using just one of these reserves as an example. We are referring to eliminating the lack of coordination and what seems to us to be unwarranted duplication in work done by the public institutes. The party committee at the Motor Vehicle Plant imeni Likhachev has commissions for comprehensive mechanization and automation of production, new technical equipment, renovation of production, quality, capital construction, among others. There are nine commissions altogether. The situation is the same in the party organizations of the various buildings, shops, and departments. Furthermore, the community is participating in the technical re-equipment of production: there is the plant trade union committee, its mass production commission, a new equipment commission, a scientific and technical society, an inventors' and rationalizers' organization, and an innovators' council. The plant also has a section devoted to young people's creative scientific and technical work, which unites all the young people's technical collectives.

Under these conditions it makes sense to create a single, coordinating organ for providing assistance to party committees and primary party organizations in managing the future development of the scientific and technical revolution. In our opinion, these organs could provide more effective assistance in realizing

the unified science and technology policy of the CPSU, the importance of which was once again emphasized at the June (1983) Plenum of the CPSU Central Committee.

We also believe that it would be useful to expand, improve, and do a more efficient job of regulating regional, sectorial, republic, and oblast scientific and technical, scientific and practical, and economic conferences. It would also be wise to hold regular scientific and practical seminars for secretaries of party committees and primary party organizations at scientific institutions and enterprises located within the boundaries of the region, republic, kray, oblast, rayon, or sector; these seminars would be used to study, generalize, and disseminate the most effective forms and methods for party management of scientific and technical progress; and to do everything possible to step up scientific and technical progress, which the party views as a very important goal[52].

FOOTNOTES

1. K. Marx and F. Engels, "Sochineniye" [Works], Vol 47, p 556.

2. cf. V. I. Lenin, "Polnoye Sobraniye Sochineniy" [Complete Works], Vol 38, p 386; Vol 39, p 314; Vol 42, p 30.

3. "Materialy XXVI S'yezda KPSS" [Materials on the 26th CPSU Congress], Moscow, 1981, p 44.

4. cf. "Materialy Plenuma Tsentral'nogo Komiteta KPSS. 14-15 iyunya 1983" [Materials on the Plenum of the CPSU Central Committee, 14-15 June 1983], Moscow, 1983, p 9.

4a. Ibid., pp 10-11.

5. cf. "Nauchno-tekhnicheskaya revolyutsiya i preimushchestva sotsializma" [The Scientific and Technical Revolution and the Advantages of Socialism], Moscow, 1975; "Sotsial'no-ekonomicheskiye problemy nauchno-tekhnicheskoy revolyutsii" [Social and Economic Problems of the Scientific and Technical Revolution], Moscow, 1976; "Nauchno-tekhnicheskaya revolyutsia i stroitel'stvo kommunizma" [The Scientific and Technical Revolution and the Construction of Communism], Moscow, 1976; "Effektivnost' proizvodstva i kachestvo raboty" [Production Efficiency and Work Quality], Moscow, 1978; "Nauchno-tekhnicheskiy progress i ekonomika sotsializma" [Scientific and Technical Progress and Socialist Economics], Moscow, 1979; "Upravleniye NIOKR: issledovaniya, razrabotki, vnedreniya" [Managing Scientific Research and Testing and Design Work: Research, Development, and Incorporation], Academician V. A. Trapeznikov, ed., Moscow, 1979; "Upravleniye razvitiyem nauki i tekhniki" [Managing the Development of Science and Technology], V. A. Trapeznikov, ed., Moscow, 1980; Ye. A. Belayev, "KPSS i organizatsiya nauki v SSSR" [The CPSU and the Organization of Science in the USSR], Moscow, 1982; A. P. Aleksandrov, "Nauka--strane" [Science for the Country], Moscow, 1983; etc.

6. cf. K. I. Taksir, "Upravleniye promyshlennost'yu SSSR" [Managing USSR Industry], Moscow, 1977; "Ekonomicheskiye problemy uskoreniya nauchno-tekhnicheskogo progressa" [Economic Problems in Stepping Up Scientific and Technical Progress], Moscow, 1980; K. I. Dubrovskiy and Yu. Yu. Yekaterinoslavskiy, "Upravleniye nauchno-tekhnicheskim razvitiyem proizvodstvennykh ob'yedineniy" [Managing the Scientific and Technical Development of Production Associations], Moscow, 1976; A. P. Dumachev, "Effektivnaya sistema organizatsii proizvodstva i upravleniya (Iz opyta raboty leningradskikh proizvodstvennykh ob'yedineniy)" [An Effective System for Organizing Production and Management (Based on the Experience of Leningrad Production Associations], Moscow, 1975; V. D. Shtundyuk, "Ob'yedineniya i tekhnicheskiy progress" [Associations and Technical Progress], Moscow, 1978; "NPO: formirovaniye, razvitiye, effektivnost'" [The Scientific Production Association: Formation, Development, Effectiveness], Moscow, 1981; N. N. Gritsenko, "NPO v sisteme upravleniya nauchno-tekhnicheskim progressom" [The Scientific Production Association in the System of Managing Scientific and Technical Progress], Moscow, 1981; etc.

7. The historiography of the problem is examined in detail in A. V. Bakunin's article "The CPSU at the Head of Scientific and Technical Progress", cf. VOPROSY ISTORII KPSS, No 10, 1982, pp 123-132.

7a. cf. "Materialy Plenuma...", op. cit., p 10.

8. cf. "KPSS v rezolyutsiyakh i resheniyakh s'yezdov, konferentsiy i plenumov TsK" [The CPSU in Resolutions and Decisions of Congresses, Conferences, and Central Committee Plenums], Vol 8, 1972, pp 396, 397.

9. cf. VESTNIK AKADEMII NAUK SSSR, No 6, 1980, p 11.

10. For more detail, cf. V. Kotel'nikov, "Problems in the Long-Range Planning of Scientific and Technical Progress", PLANOVOYE KHOZYAYSTVO, No 7, 1979, p 45.

11. "Materialy Plenuma...", op. cit., p 10.

12. cf. "Materialy XXVI S'yezda...", op. cit., pp 32, 42-44, 143-147.

13. cf. PRAVDA, 10 April 1983.

14. "Partiynyy arkhiv Instituta istorii partii pri Leningradskom obkome KPSS" [Party Archives of the Party History Institute under the Leningrad Oblast Party Committee], fund 25, catalog 106, section 19, pp 25-28; section 43, pp 49-54.

15. cf. M. F. Tolpygo, "Partiynyye komitety i tekhnicheskiy progress" [Party Committees and Technical Progress], Moscow, 1975, pp 234-235.

16. "TsPA IML" [Central Party Archives of the Marxism-Leninism Institute], fund 17, catalog 106, section 955, p 172.

17. cf. M. F. Tolpygo, op. cit., p 245.

18. Ibid., pp 247, 248.

19. "TsPA IML", op. cit., p 189.

20. cf. MOSKOVSKAYA PRAVDA 22 March 1975.

21. cf. V. V. Grishin, "O rabote Moskovskoy gorodskoy partiynoy organizatsii po osushchestvleniyu kompleksnogo podkhoda k vospitaniyu trudyashchikhsya v svete resheniy XXV s'yezda KPSS" [On the Work Done by the Moscow City Party Organization to Implement a Multi-dimensional Approach to Workers' Education in Light of the Decisions of the 25th CPSU Congress], Moscow, 1977, pp 14, 15.

22. cf. "Ocherki istorii kommunisticheskikh organizatsiy Urala" [Essays on the History of Communist Organizations in the Urals], Vol 2, Sverdlovsk, 1974, p 412.

23. K. Marx and F. Engels, op. cit., Vol 12, p 717.

24. cf. "Spravochnik partiynogo rabotnika" [A Party Worker's Handbook], 9th ed., Moscow, 1969,, p 271.

25. K. Marx and F. Engels, op. cit., Vol 25, Part 1, pp 115-116.

26. cf. V. I. Lenin, op. cit., Vol 36, pp 228-231.

27. "Materialy XXIV S'yezda KPSS" [Materials on the 24th CPSU Congress], Moscow, 1971, p 56.

28. cf. MOSKOVSKAYA PRAVDA 25 October 1969.

29. cf. MOSKOVSKAYA PRAVDA 25 September 1975.

30. cf. "Moscow in Numbers in 1981", "Statisticheskiy sbornik" [Statistical Alamanac], Moscow, 1982, p 67.

31. cf. A. P. Dumachev, "Partiynyye organizatsii i proizvodstvennyye ob'yedineniya" [Party Organizations and Production Associations], Moscow, 1977, pp 8-9.

32. Ibid., pp 92, 94.

33. "Narodnoye khozyaystvo SSSR v 1980 g." [The USSR National Economy in 1980], Moscow, 1981, p 121.

34. cf. EKONOMICHESKAYA GAZETA No 41, 1981, p 14.

35. cf. IZVESTIYA 20 March 1973.

36. cf. EKONOMICHESKAYA GAZETA No 7, 1980, p 6.

37. cf. V. I. Kushlin, "Uskoreniye vnedreniya nauchnykh dostizheniy v proizvodstvo" [Stepping Up the Incorporation of Scientific Achievements into Production], Moscow, 1976, p 122; EKONOMICHESKAYA GAZETA No 13, 1980, p 15; "Effektivnost' proizvodstva...", op. cit., p 188.

38. cf. PRAVDA 25 July 1979.

39. Ibid.

40. "Materialy XXVI S'yezda...", op. cit., p 43.

41. cf. V. V. Grishin, op. cit., pp 14, 15.

42. cf. MOSKOVSKAYA PRAVDA 24 May 1972; 31 March 1973.

43. cf. MOSKOVSKAYA PRAVDA 16 April 1978; KOMMUNIST No 9, 1980, p 39.

44. cf. PRAVDA 30 June 1980; EKONOMICHESKAYA GAZETA No 25, 1981, p 5.

45. cf. "Moskvichi v bor'be za povysheniye kachestva produktsii" [Muscovites in the Campaign to Improve Product Quality], Moscow, 1972, pp 49-50.

46. Ibid., pp 50-51.

47. PRAVDA 21 January 1981.

48. MOSKOVSKAYA PRAVDA 21 January 1981.

49. "TsPA IML", op. cit., fund 17, cat. 106, sect. 960, p 268.

50. Ibid., pp 215, 268, 269.

51. "XXVI S'yezd Kommunisticheskoy partii Sovetskogo Soyuza" [The 26th CPSU Congress]; Stenographer's Report, Vol 1, Moscow, 1981, p 232.

52. cf. "O 80-letii Vtorogo s'yezda RSDRP" [On the 80th Anniversary of the 2nd Congress of the Russian Social Democratic Workers Party], Decree of the CPSU Central Committee, 31 March 1983, Moscow, 1983, p 6.

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SIBERIAN DEVELOPMENT PROGRAM GIVEN ALL-UNION STATUS

Moscow SOVETSKAYA ROSSIYA in Russian 28 Oct 83 p 2

[Article by special correspondents I. Ognev and A. Usol'tsev, Novosibirsk-Moscow]

[Text] A quarter of a century ago, when in the picturesque woods near Novosibirsk the foundations of the first buildings had just been laid for the now world-famous Akademgorodok, the shores of the mighty Ob were shaken by explosions. These were eminently peaceful explosions that were helping workers of the Institute of Hydrodynamics under the direction of Academician M. A. Lavrent'yev to develop a theory of rapidly occurring processes.

The years have passed. Now we have been witnesses to how these fundamental studies of the institute have engendered a whole cascade of new engineering features for various production sectors.

A special scientific research program, "New Materials in Technology", has been set up in the Siberian Department of the USSR Academy of Sciences to coordinate these and other jobs. It is a component part of the complex program of acquisition of natural resources and development of the productive forces of Siberia and is better known by the name "Sibir'". Recently the board of the USSR State Committee on Science and Technology considered the degree of preparedness of Project "Sibir'" for inclusion in the State system of planning and management of scientific-technical progress.

Then what problems must be solved by science in connection with the fact that this project has achieved governmental status? These and other questions were of interest to us during our trip to the Novosibirsk Akademgorodok.

In 1977, practically the entire staff of the presidium of the Siberian Department of the USSR Academy of Sciences, eminent scientists headed by the department chairman who at that time was Academician G. I. Marchuk (now chairman of the USSR State Committee on Science and Technology), worked for several months on what is called the "shift method". They visited all the Oblast and Kray centers of Siberia.

In a certain sense, that year was a turning point. A decree of the CPSU Central Committee on activity of the Siberian Department made scientists aware of

the needs of this enormous region, of the necessity for accelerated development of its productive forces. It is on-the-spot meetings with Party, Soviet and business officials that have helped to bring to light and more precisely define the problems needing immediate intervention on the part of academic science.

Why then has the Party insistently recommended that scientists take the problems of the region under intent consideration? It would seem not just because the underground wealth of the European part of the nation, which has generously yielded up its resources for decades, has naturally begun to thin out, while Siberia affords an extensive raw material base. It is also that without development of the productive forces of the region, the advancement of the entire economy of the nation would be senseless.

It has required time and painstaking work to demonstrate the inevitability and higher gain for the nation from shifting productive forces eastward. Calculations of these forces based on inter-regional exchange have shown that bringing Siberia into the State-wide division of labor increases the final effectiveness of the national economy by 25-30 percent, although this region so far provides only one-tenth of the gross national product.

Citation of a few eloquent figures suffices to explain the attractive force of this enormous territory. Siberia has produced a fourth of the entire output of the extractive industry of the USSR, including about 40 percent of the fuel, a seventh of all electric energy, more than a fourth of all lumber, sawn timber and so on. And this is far from the total output of the region. Scientists believe that in future there will be a considerable increase in the role played by Siberia in the unified national-economic complex of the nation. Concentrated here is 75 percent of all fuel and energy resources, and the principal energy base of the nation is being set up. Here are about half of the reserves of the USSR in lumber and water resources. The southern zone of Siberia is quite favorable for production of agricultural goods. Such a high concentration of natural wealth with advantageous combination enables organization of especially extensive production facilities in Siberia within the framework of the most effective form of doing business: territorial-production complexes.

The current chairman of the presidium of the Siberian Department of the USSR Academy of Sciences, Academician V. A. Koptyug, in telling us about setting up the program, placed a high value on its significance for the region and the nation.

"The junctions between sectors" he told us, "here in Siberia, because of the scales of national-economic processes often grow into wide breaches. We have but to recall the shortage of electric energy resulting from a lag in construction of fossil-fuel electric plants, or cite the example of transporting engine fuel thousands of kilometers to the north of the Tyumen Oblast and Yakutia even though it could have been produced locally. We hope that Project 'Sibir'' is to become one of the important mechanisms of bringing to light and solving regional problems, overcoming interagency barriers."

Today, Project "Sibir'" is a complex of 40 sub-programs devoted to problems of rational use of fuel-energy, mineral raw material and biological resources,

environmental protection, complex technical and technological problems of the region, including the problems of the West Siberian Petroleum-Gas Complex, the Kuznetsk and Kansk-Achinsk coal basins, nonferrous metallurgy of Krasnoyarsk Kray, economic subjugation of the Baykal-Amur Railway zone. The project brings together about 400 organizations of verious ministries and agencies.

Of course, it would be inconceivable to approach formation of a program of such a class as Project "Sibir'" without the institution and rapid establish-

ment of the Siberian Department of the USSR Academy of Sciences, which has made firm gains in fundamental research. This research together with applied developments has provided the core of the program. It would be instructive to trace its evolution, the moreso as this subject is not at all historical.

Let us return to the expedition of scientists, during which the purposes of the first divisions of the future program were pinned down.

We were told by M. F. Zhukov, associate member of the USSR Academy of Sciences: "Of course, we had known before that Siberia needs materials that are resistant to cold and wear. But it is better to see one time how a column of pipes has to be removed now and then from a three-kilometer well for replacement of the drill that is always breaking, than to hear about it a hundred times from the drillers. Or to see for yourself how the powerful abrasive of sand in ice eats up the rubbing parts of machines before your eyes."

The scientists had to be just as charged with emotions! But besides, there were the real needs of the region that, to put it in Engel's words, pushed science forward more than ten universities. These needs were what brought about a change in the research area of many institutes. For example, in the Institute of Geography of Siberia and the Far East, research was completely changed. Previously, the collective there had been following such "peaceful" academic pursuits as the investigation of landscapes. The study continues even now, but within the framework of economic subjugation of the Baykal-Amur Railway zone, the formation of many territorial-production complexes, and is yielding specific recommendations on the best disposition of enterprises, settlements and cities. Completely different goals and results!

Academician A. A. Trofimuk, who heads the science council on Project "Sibir'", called attention to this important point: scientists previously were bringing out goals for research to help Siberia in setting up individual territorial-production complexes; now they are tackling Siberian problems that have State-wide import. For example, the concept has been instituted of long-range development of the productive forces of Siberia. In 1980, this idea was comprehensively discussed at an All-Union Conference in Novosibirsk. Taking part in the work side by side with scientists were Party and Soviet officials and businessmen. However, what has been said does not mean that all goals associated with comprehensive subjugation of the resources of Siberia are clear to researchers.

Academician A. A. Trofimuk says: "There will always be new goals brought to light and more precisely defined. This involves proper evaluation of

resources, problems of raw materials, their influence on the sociopolitical and economic goals of the State."

While the program is being prepared for confirmation as a component part of the entire system of management of scientific-technical progress in the nation, workers in the presidium of the Siberian Department, and of the State Committee on Science and Technology should once more give thought to certain problems. Aren't 40 programs rather much? Have all assignments been carefully worked out with regard to deadlines and resources? It would be nothing surprising if these questions were to come up again, even though "Sibir'" was confirmed in the Siberian Department of the USSR Academy of Sciences in 1980. But it is not even a matter of size. Project "Sibir'" is the first regional research program in the nation on such a scale and of such complexity, And its creators were feeling their way in large measure. It was necessary to develop both the procedure and the concept. And even so, there are things that have remained unclear to this day.

Says G. A. Alekseyev, chief of the summary department of planning the development of science and technology of the State Committee on Science and Technology: "It has been suggested that there should be a project monitor group in the presidium of the department. It would be the function of this group to see to it that all assignments had reached those responsible for implementation, and to keep track of the course of research and deadlines. But so far there has been no final decision on how this monitor group would fit into the State Committee. Besides, the program extends to the RSFSR Council of Ministers. This strengthens its base and ties with republic ministries -- and they were weak -- with the oblast and kray executive committees and the Councils of Ministers of autonomous republics of Siberia. But so far, the technology of these ties as well is represented only in general form."

Hence, there is still something for scientists to think about. But despite this, the program is alive and working, thanks to the general principles embodied during its formation. Let us talk about some of these principles in more detail. One of them is the concentration of efforts and funds in major areas. This does not mean just addition: two laboratories have been working, two more have been added. It means multiplication: with involvement of colleagues from related fields of knowledge and different areas of science. This principle had been put to the test even before Project "Sibir'", and its effect is well illustrated by the story of artificial emeralds. The young researcher G. Bukin brought together physicists, chemists and mathematicians, and within a year they laid on the table a bright nodule that has been given high marks by specialists.

One might object: but physicists are working with chemists right now in Novosibirsk, except in different buildings. Distribute the parts of one topic between them, and let them have at it. Of course, this is true. Except that world practice shows that it is temporary collectives that save time, and hence money as well.

What is preventing formation of such groups? The principles and instructions of the State Committee of Labor, the procedure for research funding. Including

Project "Sibir'". Its topics are on the budgets of institutes, and the project fund of the State Committee on Science and Technology is meager. Some institutes do not even turn it into a "bone of contention" for program directors, simply turning it over entirely to auxiliary services. Nonetheless, they work on researchers, and often hold them back because of their weakness.

But while scientists can still rearrange paragraphs and instructions in Akademgorodok, this is much harder to do on the stage of applied research. For example, a minor section -- mound lixivation of ores, which is "Copper Ores of Udokan" in the program -- is being worked out by mathematical physicists from Magadan and geochemists from the All-Union Scientific Research Institute of Mineral Raw Material... Before Project "Sibir'", pieces of the topic were being worked on in different corners of the nation with a poor idea of how far their partners had got. Now they meet, albeit once a year, to discuss the course of their work within the scope of the project. This is already quite a bit: people are in direct communication, enriching one another with information. And all the same, sectoral research institutes do not even consider it necessary to make regular reports to the science council of the project on what has been done during the year. The council can't tell *them* what to do! And what if a temporary collective is formed out of the partners, and the council or the State Committee on Science and Technology is given the capability of funding it?

Now that a decree has been passed by the CPSU Central Committee and the USSR Council of Ministers on scientific-technical progress, it will evidently be easier to solve this problem. This document makes a direct statement of the need for expanding the practice of organizing temporary scientific-production subdivisions (complexes) on major problems of the national economy. We will tell how this is to be handled in the second part of this article.

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SIBERIAN DEVELOPMENT PROJECT STILL FACING PROBLEMS

Moscow SOVETSKAYA ROSSIYA in Russian 29 Oct 83 pp 1, 2

[Conclusion of article by special correspondents I. Ognev and A. Usol'tsev, Novosibirsk-Moscow (for beginning of article see SOVETSKAYA ROSSIYA, 28 Oct 83, p 1)]

[Text] During the last two five-year plans, the Siberian Department of the USSR Academy of Sciences has turned over more than 900 developments to ministries and agencies. The level can be judged by the fact that they are protected by more than 3,800 author's certificates and 660 patents in industrially developed nations. According to data that are far from complete, the effect from introducing these developments has exceeded two billion rubles.

We have cited these figures not just to praise Siberian scientists. In addition the facts show that a certain system for transmitting research results into practice has grown up between the Siberian department and the sectors. Let us briefly note the stages of establishment of this system. First there were agreements of the department with enterprises of Novosibirsk and other cities. Then the principle of "going out to the sector" was formulated. In parallel with this, a "belt of introduction" was set up around Akademgorodok. This included research institutes and design offices of so-called dual jurisdiction. They were funded by sectors, and made accountable to these sectors for results of activity, while the institutes of the Siberian Department were to have the greatest influence on formation of the research area. It was assumed that this mechanism would "enliven" the results of scientific developments, if not in all sectors where they could be used, then at least certainly in specialized sectors.

Researchers were very interested in this, because with the years they had been increasingly convinced of the need for inverse ties with industry. The times when sticks and strings could be used for doing just about any experiment had long ago vanished into oblivion. Now the institutes had to be provided with the most complex instruments, equipment, materials heretofore unheard of -- and this was no whim, but the order of the day.

Associate Mmember of the USSR Academy of Sciences A. V. Rzhanov, director of the Institute of Semiconductor Physics, rightly feels that "the development of solid state physics would have ended long ago if objects provided by nature were all that was studied. Without the advanced development of the technology

of semiconductor materials, we could not have grown crystals of unprecedented purity and perfection, and consequently we would not have micro-, opto- and acoustoelectronics, whose rapid development affects many aspects of our life.

Obviously, primitive equipment could never produce the subtle technologies for growing the crystals that scientists need. And only industry can provide the equipment. The circle has been closed!

However, the concern for contacts with practice is frequently one-sided. Even though the above-mentioned 900 developments of the Siberian Department of the Academy of Sciences are taken as introduced, only 43 of them have become the property of most of the enterprises in their sectors, rather than just one. This situation has also puzzled the developers of Project "Sibir'", who had taken continuity of introduction to be another major principle of the program.

The reasoning often goes like this: it doesn't matter that we have dragged out the mastery of a good machine or technology. We'll wait for something better. They wait and... cannot comprehend it. The thing is that people undergo a gradual change in psychology and skill. That is whay the principle of continuity of introduction is important.

How can this be put into effect in the structure of Project "Sibir'" if only sixty of the four hundred organizations associated with the project belong to the Siberian Department of the Academy of Sciences, and these are the only ones that are actually under the influence of the science council of the program? It would seem that the many years of research should have put the mechanism for transferring developments into order, but it is always breaking down. Why? Let us feel through the channels of the system for transmitting developments and see how these breakdowns occur.

One of the channels is 22 agreements of cooperation with sectors, with signatories on the highest level from both sides. However, in reality everything boils down to contacts of the department and the head institutes of the sectors and the individual enterprises where the innovations are being introduced, rather than with the management of ministries. The head research institute in the best case is alotted the assigned appropriations, but boycotts the development. After all, the work of sectors on the whole up until now has been evaluated on the principle: the more money spent, the better. So cardinal innovations are of no moment to them. Besides, the head research institute could even be reproached for an academic development: why *you*? And what of the enterprises? The agreement with the department calls for joint use of their resources. These are instruments, equipment and materials in short supply. The situation is explained by O. Sosnin, deputy director of the Institute of Hydrodynamics: "We are even ready to pay, but everything is strictly funded and often the choice of plant has not been predetermined in our favor. In the best case we get a supplementary payroll fund. Too little!" But the ministries in the person of their scientific-technical boards limit their functions to pointed inquires: what are the scientists doing? "Now we think: should we answer or not? The benefit from our information is often no benefit at all, just a lot of trouble" says O. Sosnin.

Under these conditions, academic institutes are forced to make contacts with plants whose directors, despite difficulties, frequently to the detriment of

current plans, will set aside designers, equipment and other resources. Unfortunately, such enterprises are often situated in the European part of the nation, and it takes years for the discoveries of Siberian scientists to penetrate into the eastern territories. The same Institute of Hydrodynamics is introducing a system for explosive coating of parts in the Ukraine. Of course, this development is needed everywhere, but especially in Siberia!

Underlying the channel of the relation between science and production is an economic experiment that has been in progress in the Siberian Department of the Academy of Sciences since 1972. It has a dual purpose: to increase the effectiveness of fundamental research, and to accelerate the introduction of research results. To start with, three institutes were working under the conditions of this experiment, and since 1979, nearly all of them. In essence, the experiment is simple. The institutes have received the right to use deductions from performance of economic contracts with enterprises to make up funds for material incentive, sociocultural measures and housing construction, and also a research development fund. The tentative results of the experiment have been positively evaluated. The research institutes have shown a drastic rise of up to 30 percent in the volume of economic contracts. Now no one has to be talked into participation. On the contrary, the science councils of the institutes have to restrain the hotheads and see to it that the directions of the economic contracts coincide with the scientific interests of hte collective. There has been some increase in the specific weight of agreements lasting more than a year. Because of this, developments can be brought to the practical level that are more substantial than formerly. Finally, the experiment has had a beneficial effect on the course of fundamental research, training of personnel, and the effect of feedback with industry has extended the capabilities of the research institutes.

But the point is that the experiment is an incentive only to scientists. For the rest, nothing has changed. There has been no increase in capacities of design offices and the experimental-industrial base in the Siberian Department of the Academy of Sciences. Consequently, scientists cannot show their "wares" to good advantage to the sectors as heretofore, which increases the probability of being turned down by industry. Here is just one example from the "multi-series implementation detective." Biologists of the Institute of Cytology and Genetics had produced "gibbersid", and organic chemists had developed a technology for producing the chemical. The substance had been developed under the vigilant supervision of the USSR State Planning Committee. Lo and behold: surface treatment with the chemical increases the yield of tomatoes, millet, grapes and maize by 15-25 percent!

Says B. Prilepskiy, director of the Berdsk Chemical Plant: "Gibbersib has not been included on our production plan for years now, although we have been making it for a long time. Of course, this hurts the plant indices. It is understandable that risk pushes us not toward the scientists, but in an entirely different direction."

Now let's look at another major channel of transmitting developments: the "belt of introduction." The essence of the idea is that academic institutes go out to the sector not directly, but rather through intermediaries: the

research institutes and design offices of dual jurisdiction. There are now 12 of these organizations around Akademgorodok, and they are far from young. Everyone with whom we spoke was of a similar opinion: it's a great idea. But when it comes to execution... It has turned out over the years that these research institutes and design offices are slipping further and further from the influence of the academic institutes. And is it any wonder? The "belt" is accountable to the sectors from which they get their funding. What can the scientists send up against this material force? Logic? Reason? It's an uneven battle.

One of the strongest institutions in the belt is the Energokhimmash Special Technological Design Office. A. P. Burdukov, the chief of this office, feels that setting up organizations like this is justified on the whole. Their main advantage: in the applied plan they develop the ideas of the institutes from which they get their inception. There is the capability of producing technology and equipment on the highest level. As stressed by Anatoliy Petrovich, "I know the research institutes and design offices of the 'belt' quite well, and they show themselves to advantage in potential capabilities when compared with like organizations of the sectors."

But here is the opinion of Academician G. K. Boreskov, director of the Institute of Catalysis. The Special Design Office of Catalysts with which this institute has interacted since 1970 is a real help in some cases. But on the whole, the effect of the design office is inadequate, although in numbers of personnel it is a whole institute. In the final analysis, the ideas of scientists find recognition, but with a delay of five or ten years. "If I have something that needs to be done in a hurry, I don't go to the design office" says Georgiy Konstantinovich. In 1982, sixty developments of the institute were in a critical state. They could be realized in only one way: by suspending research and sending colleagues out to the plants.

"But there weren't enough people" says G. K. Boreskov, "events in the world of science are fast-paced."

But how do the scientists "extricate" themselves from the situation? Nothing to it. The director packs his suitcase, and taking advantage of personal connections he manages an agreement to get something tried somewhere. Or, to use V. A. Koptyug's expression, he creates a system of supports. But is this any way out? "The higher the qualification of the scientist, the less chance he has of using it for its due purpose; authority is used in setting up this system of supports" says Valentin Afanas'yevich.

And here is still another flaw in the "belt": its research institutes and design offices work for their own sectors, and this same Institute of Catalysis goes out to three ministries. In this situation it is very difficult to understand who is to do what.

Similar arguments have been advanced by A. P. Burdukov as well. In particular, he tells this story. Four years ago his design office was making plasmotrons. Technology based on these devices makes it possible to eliminate iron smelting in blast furnaces. Swedes who had visited the design office rated the

technology as superior to that of the United States. It can be used to great advantage in minifactories that are to be located in Siberia. Things started out well, but gradually everything came to a standstill. Simple logic: what has this ministry to do with ferrous metallurgy?

As we can see, even the directors of the design offices of the "belt" that are in good standing find flaws in its status-quo. There are two viewpoints on what should be done with it now. One is to transfer them to the State Committee on Science and Technology. However, opponents object that in such a case we could cut the "umbilical cord" that connects the academic research institutes with the sectors. They feel that it would be better to transfer the "belt" to the Academy of Sciences. Then its institutes would not have to converse with industry by signs, as is now the case, but would be able to present their ideas in clear documentation. And even in experimental models of machines, and in short runs of technologies if the "belt" should be pieced out with experimental production.

The general problems of using results of scientific research as applied to Project "Sibir'" are complicated still further by the fact that it embodies consistent implementation of a unified technical policy in an enormous and difficult region. Before confirmation of the program by the State Committee on Science and Technology, this was done on the basis of agreements with ministries. We have already seen how they operate. As they are beyond the scope of the State plan, they lack force. With the designation of governmental status for Project "Sibir'", the course of work in its main units has been brought into line with dozens of ministries and agencies. It is a gigantic job! It requires determining needs for all kinds of resources, the deadlines for completion of stages. Now it is necessary to formulate still another regional program: the scientific production program, within which all developments of Project "Sibir'" must be realized.

"But just what should be the mechanism of interaction of these two programs is not yet clear to us" acknowledges G. A. Alekseyev, division chief of the State Committee on Science and Technology. "It is no secret that ministries frequently pursue their own purposes, which do not always coincide with the State-wide purposes. For example, there is no way that we can try to get the sectors to set aside even one and a half percent of their capital investments for setting up their own experimental production base. We write reports to the government about them, we listen to ministers on the Committee Board. It helps, but not always."

...We have touched upon nearly all channels of the system utilized in realizing the developments of Project "Sibir'", and indeed of the whole Siberina Department.

Even a cursory analysis shows that the above-mentioned "accelerators" connected to the main "body" help to move things forward, but the pace reached so far is unsatisfactory. V. A. Koptyug has put it very neatly: there are elements of good relations, there is the force of influence of Party agencies, but there is no effective organizational and economic mechanism. Let us hope that the recent decree of the CPSU Central Committee and the USSR Council of Ministers on scientific-technical progress will help to generate such a mechanism.

In these articles we have examined only a few key problems of management of fundamental and applied research within the scope of Project "Sibir'" and the implementation of research results. So far, the workers in the department, and in the State Committee on Science and Technology (which has become the main sponsor in charge of the project) do not have any answers for many of these problmes. But this does not mean that such answers do not exist. In the late fifties and early sixties the approach of the goal-oriented project was intensely developed throughout the world. It is being more and more confidently put to use in our national economy. Project "Sibir'" is an incredibly apt object for this approach. Here's room for expansion! Unfortunately, the people who had to develop the methodology of construction and management of Project "Sibir'" had scientific interests far removed from the approach of the goal-oriented project. It seems to us that it is still not too late for speicalists, for example from the Institute of Systems Analysis, to show a professional interest in Project "Sibir'".

Project "Sibir'" is a program of action. Of course, as of now it is a long way from perfect -- its developers have told us this straight out. There are still breakdowns of individual components. But one thing is sure: the experience accumulated in the course of its development and transfer of results into practice is a step forward in management of scientific-technical progress.

In speaking at the June 1983 plenary session of the CPSU Central Committee, Yu. V. Andropov called attention to the poor state of affairs in introduction of new technology: "The development of such a system of organizational, economic and moral measures as would interest both managers and workers, and of course scientists and designers in updating technology would make working in the old way unprofitable. This is our goal." As we know, not long ago the Party and the government issued a decree on scientific-technical progress. The work experience in setting up Project Sibir'" and this decree that proposes ways of solving many problems provide firm prerequisites for successful realization of the extensive regional project.

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OPERATION OF USSR PATENT REVIEW BOARD EXPLAINED

Moscow TRUD in Russian 25 Nov 83 p 2

[Article by V. Vostrukhin: "Experts"]

> [Text] More than 200,000 claims for inventions are filed every year in the USSR State Committee on Inventions and Discoveries. Patent expertise decides what is to be accepted as an invention and what is not. And the most complicated and controversial matters go to the Control Council of Scientific-Technical Expertise. Our story is about the work of this service.

A claim has come in that is simultaneously both complicated and controversial. Soon there is a meeting of a board of experts that is to decide its fate. Doctor of Technical Sciences, Professor A. F. Kraynev, chairman of the Control Council, introduces me to the course of the "business."

A candidate of technical sciences has invented a hydraulic "muscle", an original device that can produce very large forces with very small displacements. In shape, it really resembles a flexed biceps. The author has improved the "muscle" -- several "biceps" have been connected in series. The All-Union Scientific Research Institute of Governmental Patent Expertise, after studying this proposal, has refused to grant an author's certificate. The inventor has disagreed with the decision of the experts, and has petitioned for review of the claim in the Control Council. And here the materials have been brought to the attention of expert A. N. L'vov.

At first, he was inclined to agree with the opinion of the specialists at the institute [VNIIGPE]. What the author had considered an invention was not. And even so, L'vov was not hasty with his conclusion. The Control Council has a rule: do not limit yourself to analyzing the complaint. The expert must very meticulously analyze the materials of the claim, even if the proposal has not been formulated with adequate clarity, and if possible, look at the invention.

A Control Council expert is a unique profession. There are only 116 of them in the entire country. The expert must be analytical in thinking, erudite, and at the same time a specialist in a narrow class. He must have the stamina

and patience of a diplomat in considering controversies. On top of everything else, he must have the civic fortitude to inform an author that there is no invention in his claim. Or to inform the board at VNIIGPE that they have made an erroneous decision.

In the past, most members of the Control Council have been science workers, leading designers, the authors of books or inventors.

A great responsibility lies on them. People may appeal to the Control Council who do not accept the decision of the patent board. This is the right of every citizen of our nation.

The decision of the council is final, their is no right of further appeal. The decision can be protested only by the chairman of the State Committee on Inventions and Discoveries, but only the Control Council itself has the right of review.

A. N. L'vov was prompted by experience and intuition: the design was only outwardly simple. The in-depth study that he undertook showed that the author had given an incorrect description of the working principle of his own invention. Connection of the "biceps" in series gave an unexpected effect. The "muscles" began to act as backups for one another. When one "weakened", a second and third were activated, and the force once more rose rapidly. A. N. L'vov and two other members of the board felt that the author's certificate should be granted. It really was an invention.

"Then VNIIGPE has made a mistake?" I asked.

"Not exactly. The author's proposal was improperly formulated, and that is not the fault of the patent expert board" answered A. F. Kraynev. "Many arguments come up because of sloppy formulation of claims. In our day, the business of invention is no longer something uncommon and miraculous. Statistics show that ninety percent of the 200,000 claims coming in at VNIIGPE are "service inventions' made by specialists during work at their own work stations. This should be taken as a normal process that is organically inherent in the development of new objects in any sectors of technology."

But most arguments are about the criterion of "significant difference."

In the working archives of the council I came upon the claim of Yu. A. Chukalin from Sestroretsk. He had improved upon the already known idea of cutting a board with a jet of water. Chukalin proposed adding an abrasive material such as quartz sand to the water. He stated that this would increase the productivity of the work. But the experts turned down the engineer on the criterion of "significant difference." The claim came to the Control Council, and long years of correspondence began.

"Cutting wood with a jet of water is known. The use of abrasive material in water jets is also known. Likewise the fact that there is an improvement in productivity of the work" explain the experts. "By combining two known things you have obtained the obvious result that they give. The proposal is useful, but it is not an invention."

Chukalin disagreed with the opinion of the board, and began to write complaints. In such cases, the experts only shrug and say that this is his right. It is simply a pity that so much time has to be wasted in repeating the well-reasoned answer. The criterion of "significant difference" is complex, but definite. It characterizes the size of the creative contribution of the inventor.

"We carry on extensive correspondence with authors" continues A. F. Kraynev. "Unfortunately it is not always fruitful. Right now we are getting about 4,000 letters each year from 1,700 claimants. Just as many are being sent out. Almost half of this mountain of paper is useless correspondence. The ones creating it are a small number of authors who disagree with the decision of the Control Council. The argument is no longer about the invention, but around it."

The right of utilization of all inventions protected by author's certificates belongs to the State. This is our law in the Soviet Union. An incentive reward is initially paid for a "service invention." If there is but one author, he gets from twenty to fifty rubles. For a team of authors, this sum is increased to two hundred rubles, but not more than fifty for each. And if the invention is used and is proved to be economically effective, the allowances to the author's account may reach 20,000 rubles.

Those who would subvert the laws of nature have a lot to answer for. Imagine that you are a jeweler. A client brings you a gram of gold and asks you to make a ring of it with a mass of 1.66 grams. "But this is impossible" you exclaim. I believe your opinion is in agreement with that of N. S. Klinkovich, prorector on science work of Dnepropetrovsk Metallurgical Institute, who signed the favorable conclusion on a claim for a device with efficiency of 1.66, i. e. at least 66 percent greater than is fundamentally possible; and the collaborators of "Irtyshgesstroy" who sent to the Control Council a report on tests of a turbine with efficiency of 164 percent. The report is certified by a heraldic seal, and nonetheless contradicts the laws of the material world.

It is amazing that nonsensical claims and reports are written not by amateurs, but by specialists who teach these laws in classrooms and use them in practice. Thus it is a matter of elementary irresponsibility of researchers or ineptitude in setting up a physical experiment.

"Considering the constantly increasing requirements for the level of development of engineering and technology" says A. F. Kraynev, "the State Committee on Inventions and Discoveries has prepared suggestions on changing the Regulations on Discoveries, Inventions and Rationalizer Proposals that are aimed at further improvement of quality and elevation of the level of proposals to be recognized as inventions."

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OFFICIAL DISCUSSES WORK IN FIELD OF INVENTIONS

Moscow IZVESTIYA in Russian 21 Nov 83 p 2

[Interview with I.S. Nayashkov, chairman of the USSR State Committee for Inventions and Discoveries, by S. Os'minina: "The Equipment of the Future is Being Created Today"]

[Text] An expanded session of the Collegium of the USSR State Committee for Inventions and Discoveries was held on 18 November on tasks posed in the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures to Accelerate Scientific and Technological Progress in the National Economy." Leaders of 29 ministries and departments took part. Following the session our correspondant S. Os'minina spoke with I.S. Nayashkov, chairman of the USSR State Committee for Inventions and Discoveries.

[Question] Ivan Semenovich, the definition of inventions as the most important tool for accelerating scientific and technological progress has now been established. But there are various ways of interpreting this definition. How do you understand it?

[Answer] Until relatively recently the term inventions was taken to mean independent technical creativity. And like any sort of creativity, all paths of development have been opened up for invention work in our nation. It is not this spontaneous demonstration of the people's talents which we refer to as the most important tool for accelerating scientific and technological progress, however.

Science has become the society's productive force in our nation in recent decades, as it has throughout the world, and tens of thousands of people have become active in creative scientific and technical work. And not as a sideline, but as their duty, as their daily work. Almost 90 percent of the applications for certificates of invention received by the appraisal agencies come from enterprises and organizations. And the task is one of seeing that this work is highly effective and truly creative, that it results in products which incorporate technological solutions superior to those of the best Soviet and foreign models. Work on the inventive level--this is the motto of the day.

[Question] This is no longer simply a technical matter, but a moral and social problem as well....

[Answer] Precisely. Furthermore, this is a question of principal both for our entire economy and for each individual who shapes that economy with his daily work: Does he have the right to perform at a level below his own capabilities?

Consider the following data for 1982. Only 22 percent of the units of new equipment whose production was scheduled for mastery by the State Plan in organizations of the industrial ministeries incorporated inventions. In other words, only 22 percent of everything created in most branches embodied new technical concepts. This means that the main efforts of those branches were spent mastering the production of equipment which, strictly speaking, cannot be called new equipment, because it is actually only improved models of existing equipment. Naturally, the economic effect from this is far more modest than it could be if the lathe, instrument or assembly embodied a fundamentally new technical design--one which could be recognized as an invention. This is the essence of the matter.

Consider the fact that state funds are allocated for this merely improved equipment, that hundreds or even thousands of people introduce it into production, rearrange the technology to produce it and train workers....

[Question] Is this not why the ministries and departments accepted only 32 of the 154 inventions recommended by your committee for inclusion in the 1982 State Plan?

[Answer] Of course. And this is why it is of basic importance for inventions not to be introduced into the branch plans as something existing separately but to be used at the initial stage of development, at the stage of defining the project requirements.

[Question] The decree passed by the CPSU Central Committee and the USSR Council of Ministers assigned the State Committee for Inventions and Discoveries the task of increasing its supervision of invention work. How do you plan to accomplish this?

[Answer] One of the main ways will consist in combining into an inseparable whole two as yet separate planning processes--the planning of invention work and planning for the development of new equipment. New equipment should be created only on the basis of inventions. This will require that we work jointly with the USSR State Committee for Science and Technology.

We are going to have to improve the branch systems for directing the invention work. We should not be disturbed by this not entirely conventional formulation of the problem. It involves concentrating the creative work of the people on the most important and crucial problems, their planned resolution at the highest possible technological level and the application of scientific and technological achievements specified equally rigidly by the plan. Some ministeries have added subsystems for invention work to their branch ASU [automated control system]. And they have done the right thing. By means of its branch system for directing invention work the Ministry of Chemical and Petroleum Machine Building, for example, has managed to increase the economic effect of the use of inventions more than 3-fold during the first 2 years of this five-year plan.

[Question] Does this mean that the level of invention work is one of the most important indices of performance for the branch as a whole and for its individual units--the scientific establishment and the production subdivision?

[Answer] Precisely. And we propose that this criterion of evaluation be introduced for analyzing the economic units involved with scientific and technological progress.

[Question] The very concept "invention" implies innovativeness of technological solutions. Such solutions do not occur accidentally....

[Answer] Absolutely not. It is impossible to arrive at a new technological solution at the world level or above that level today without a serious study of international experience in the development of the specific type of equipment. It takes years for scientific and technological information to reach the developer by the traditional method. To count on that is to fall hopelessly behind. It is necessary to study patent information when beginning the project, in the process of carrying it out and after its completion, when a technical design created at the level of an invention should receive legal protection--the inventor's certificate. This is how the patent departments of our best scientific research institutes, design offices and industrial associations organize their work. The Electric Welding Institute imeni Paton, the VNIIMetmash [All-Union Scientific Research, Planning and Design Institute of Metallurgical Machinery], the "Elektrosila" association, Gintsvetmet [State Scientific Research Institute of Nonferrous Metals] and many others do so. Unfortunately, a large number of scientific and industrial subdivisions are still underestimating the role of patent studies. More than half of the enterprises and approximately one third of the scientific research institutes have only one person in their patent department....

[Question] The decree "On Measures to Accelerate Scientific and Technological Progress in the National Economy" stresses "providing the developers of new equipment with better patent information." What is being done to achieve this?

[Answer] The State Patent Information System (GSPI) was created in our nation 4 years ago. It includes, in addition to the head organizations--the "Poisk" NPO [scientific association] and the All-Union Technical Patent Library--108 territorial patent files, 1,200 branch and 5,000 enterprise and organization patent files. They contain a total of 700 million descriptions of items for applications, inventor's certificates and patents. We have created the All-Union Magnetic Tape Service. Twice a month it provides group subscribers with current bibliographic information on inventions coming out in the world. The "Poisk" Scientific Production Association fills tens of thousands of orders efficiently and promptly. Work has already been completed there to create a system of remote access to information bases containing data on analogous patents and inventions already introduced. Beginning in 1985 the system will operate on an industrial schedule.

Unfortunately, however, the possibilities of the state patent information system are still not being fully utilized. For example, only half of the 5,000 enterprises and organizations which are the direct consumers of patent information

take advantage of the services of the All-Union Magnetic Tape Service. Patent research is performed for only half of the scientific projects which could result in registration of inventions in the ministries of the fish industry, gricultural machine building, food, meat and diary industries and Goskomsel'khoztekhnika [State Committee for Supply of Production Equipment for Agriculture]. It is not suprising that half of the applications for certificates of invention received by these branches are rejected by the panels of experts.

[Question] And the last question. What are your committee's possibilities for exercising control to see that inventions are introduced into the national economy as rapidly as possible, a matter also covered in the decree?

[Answer] I feel that we are still not making adequate use of our possibilities. At joint meetings of our collegium and the ministries we regularly discuss matters pertaining to the adoption of inventions in various branches. We recommend that such a study be performed systematically, and not just on the branch scale. Together with the ministries and departments concerned we shall consider how the adoption of the most effective inventions of an inter-branch nature are being adopted as well as questions pertaining to the organization of projects for using scientific discoveries in the national economy. The recommendations we send to USSR Gosplan, ministries and Union republics for the adoption of inventions will now be supplemented with recommendations for the use of highly effective inventions in the realization of the Food, Energy and other programs.

It is obviously time to do more than simply work out these recommendations well. We also need to give them the force of mandatory assignments. I am talking about the creation of a corresponding section in the national economic plan, which, like the other sections presently included in the plan, would precisely define the assignment, those responsible for implementing it, target dates and volumes of work. We are presently working on this with the USSR Gosplan. It is our duty to do everything possible to see that highly effective and progressive technical solutions do not simply remain on paper, as they say, but work for the good of the Soviet people.

11499
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WORK OF URAL SCIENTIFIC CENTER DISCUSSED

Moscow IZVESTIYA in Russian 20 Oct 83 p 1

[Report: "In the CPSU Central Committee--the CPSU Central Committee Discussed the Subject 'On the Work of the Ural Scientific Center of the USSR Academy of Sciences'."]

[Text] The decree which was passed states that the Ural Scientific Center of the USSR Academy of Sciences is making a large contribution to the development of the nation's economy and the productive forces of the Urals and to the application of their natural resources, that it is working persistently to enhance the level and the effectiveness of fundamental and applied research and is playing an important role with respect to improving the skills of scientific cadres and developing education and culture in the USSR's oldest industrial region.

In recent years the center's institutes have carried out a number of important theoretical and applied projects in the fields of mathematics, physics, mechanics and economics. The investigations of the geologists, geophysicists and economists have focused on the development of the scientific bases for further expanding the minerals and raw materials base of the Urals. The center has performed a certain amount of work to build up the materials and equipment base and to retain cadres at the scientific research institutes and laboratories.

The performance of the Ural Scientific Center of the USSR Academy of Sciences, which has considerable scientific potential, however, does not yet fully measure up to the party's decisions. The center's scientists are not doing enough to increase the effectiveness of public production, to enhance labor productivity or to develop the region economically and socially.

The Presidium of the Ural Scientific Center of the USSR Academy of Sciences is not striving with adequate persistence to unite the efforts of the academy's branch scientific research institutes and higher educational institutions of the Urals. The inter-departmental council for coordinating scientific research, created in the Presidium, is still not working with adequate vigor to mobilize the scientists for the resolution of the region's most urgent problems and is not doing enough to draw the branch institutes and VUZ's into the sphere of its activities, especially those located outside Sverdlovsk Oblast.

The center's scientific institutions have not established close collaboration or established scientific production cooperation with enterprises and organizations of the national economic sectors and have not accelerated the introduction of the scientific results on the practical level. This is especially important for the reconstruction and technical reequipment of Ural industry.

The Presidium of the Ural Scientific Center of the USSR Academy of Sciences is not devoting adequate attention to the elaboration of problems of history or matters of social development for the Urals and indocrination of the workers, especially the youth.

The party committes are not adequately focusing the efforts of collectives on the tasks of enhancing the effectiveness of scientific study and accelerating the adoption of their results in production. They are not satisfactorily coordinating the organizational and practical work of the party organizations of scientific institutions and have still not launched a proper campaign to strengthen discipline, improve labor organization and enhance the effectiveness of ideological and indocrinational and mass political work.

The CPSU Central Committee stressed the fact that the main task of the Ural Scientific Center of the USSR Academy of Sciences is one of systematically and persistently implementing the tasks set forth at the 26th CPSU Congress, the aims outlined at the June 1983 Plenum of the CPSU Central Committee, the decree passed by the CPSU Central Committee and the USSR Council of Ministers "On Measures to Accelerate Scientific and Technological Progress in the National Ecomomy" or the principles and conclusions contained in statements by Comrade Yu. V. Andropov, general secretary of the CPSU Central Committee and chairman of the Presidium of the USSR Supreme Soviet, on the matters of improving the effectiveness and the quality of scientific research and making maximum use of their results in the national economy.

The decree states that the efforts of these scientists must focus on key fundamental and applied research, based on pressing needs for development of the productive forces of the Urals, production intensification and the elimination of unjustified duplication and work on minor subjects. They need to persistently expand and strengthen their ties with production and extensively develop their research in the subjects covered by agreements. They must work in creative cooperation with the enterprises to reduce the amount of time required to work out and apply progressive technologies, equipment, instruments and materials. They must draw scientists and specialists of the branch scientific research institutes, industrial enterprises, higher educational institutions,divisions of the All-Union Society of Inventors and Rationalizers, scientific and technical societies into greater involvment in the accomplishment of the tasks for accelerating the use of scientific achievements in production.

It was recommended that the Presidium of the Ural Scientific Center of the USSR Academy of Sciences resolutely improve coordination of the work of the region's scientific institutions, regardless of their departmental affiliation. It should involve them directly in the development and implementation of comprehensive scientific and technical programs and create temporary inter-branch scientific subdivisions where necessary. It should give special attention to research involved in the fulfillment of the Food and Energy Programs.

The CPSU Central Committee called upon the scientific center's leaders to strive persistently to substantially increase the contribution made by the scientists to the reconstruction, modernization and technical reequipment of machine building, metallurgical and chemical enterprises, development of the agroindustrial complex, expansion of the minerals and raw materials base, the complete processing of raw materials, the creation of fundamentally new no-waste and energy-efficient technologies, the achievement of efficient use of natural conditions and the recultivation of land in the industrial zones.

The center's Presidium has been assigned the task of promoting the proper distribution of the personnel and equipment in the most important directions of scientific work and the establishment of a well-based ratio between scientific research and experimental design work in order to make more complete use of the scientific and the experimental production capability. It is to increase the role of the inter-departmental council at the scientific center with respect to coordinating scientific research in the natural and social sciences for mobilizing scientists to resolve the region's pressing problems.

It was recommended that the Ural Scientific Center of the USSR Academy of Sciences improve the work aimed at the practical realization of the results of fundamental and applied research and promote the extensive adoption of scientific achievements in production.

It was recognized as essential that steps be taken to make fuller and more efficient use of the scientific capability of the Urals and to increase its practical results for production. On the basis of this, the USSR State Committee for Science and Technology and the USSR Academy of Sciences, together with the USSR Gosplan, the RSFSR Council of Ministers and the ministries involved, were ordered to include in the next 5-year plan measures for the creation and the technical outfitting of testing and experimental production bases in the scientific organizations best prepared for this.

It was recommended that they, together with the appropriate ministeries and departments, arrange for the experimental production base of industrial enterprises and organizations of the Urals to be used more fully for the performance of joint experiments and testing of new machinery, equipment, materials and technological processes on the basis of scientific and technological programs and agreements on socialist collaboration and the introduction of scientific results into production. It was recommended that a statute defining the procedure for the collective use of these bases by academy and branch organizations, industrial enterprises and higher educational institutions be worked out and approved.

Specific steps were defined for developing and building up the material base of the Ural Scientific Center of the USSR Academy of Sciences and for improving housing and living conditions for its workers.

It was recommended that the USSR Academy of Sciences consider and approve the program of research for the Ural Scientific Center from the standpoint of the

need to accelerate the development of work in the fundamental and applied areas of physical and technical problems of metallurgy and machine building, organic chemistry and ecology, linking them with the prospects for the region's economic development and with the work of the Bashkir and Komi affiliates and the Siberian Department of the USSR Academy of Sciences. It was recommended that workers of local and central planning bodies be drawn into the development of the regional, comprehensive programs for scientific and technological progress.

The decree directs attention to the need to achieve a decisive shifting of all scientists and social scientists of the Urals toward the real, practical tasks and to step up work on the social and economic problems of comprehensive development of the Ural productive forces, production specialization and cooperation and the history of the creation and development of the working class and the kolkhoz peasantry and contemporary social processes.

Noting that the construction and installation ministries and planning agencies are underestimating the importance of the priority start-up of facilities for the Ural experimental and testing base as the determining factor for accelerating its scientific and technological progress, the CPSU Central Committee demanded that the USSR Ministry of Construction of Heavy Industry Enterprises, the USSR Ministry of Industrial Construction, the Ministry of Construction of Petroleum and Gas Industry Enterprises, the USSR Gosplan and the USSR Academy of Sciences take steps to correct this deficiency and assure the fulfillment of construction and installation plans and the timely start-up of facilities for the Ural Scientific Center, during both the current and the 12th five-year periods.

The CPSU Central Committee has ordered the Sverdlovsk, Perm, Udmurt, Chelyavinsk, and Orenburg CPSU obkoms to increase the supervision by party organizations of scientific institutions of the Ural Scientific Center of the USSR Academy of Sciences and to increase their influence on the performance of the scientific collectives, on the enhancement of effectiveness for scientific research and the creation of a climate of creative quest and great activeness on the part of all workers, of responsibility on their part for the end results.

It was recommended that the oblast party committees and the primary party organizations give greater attention to the training and distribution of highly skilled cadres, to their mastery of the ideological treasures of Marxism-Leninism, their profound comprehension of the CPSU's theoretical and practical work and their development of a communist outlook on the world.

Because of the need to coordinate the effort of the communists for fulfilling the tasks assigned the collectives and for exchanging work experience, it was judged expedient to create a council of secretaries of party organizations of institutions of the Ural Scientific Center of the USSR Academy of Sciences.

11499
CSO: 1814/51

SCIENTIST DEPLORES LACK OF EXPERIMENTAL RESEARCH

Moscow IZVESTIYA in Russian 17 Oct 83 p 2

[Article by Professor Yu. Shneyder, doctor of technical sciences, in Leningrad: ["A Brief But Important Article: Experiments are Also Science"]

[Text] More than once--during defense of a dissertation, after the explanation of a well-executed experiment in the full meaning of the word "scientific research"--I've had to listen to a question which every competitor fears: "But where is the science here?". But permit me to ask: since when has experimental research not been considered scientific?

It is well-known, that many of the fundamental discoveries in science were made by experimentors. But at the same time, the prestigiousness of experimental research has, in my opinion, declined. And this applies especially to research in the area of technology. A harmful tendency has been noted toward "paper research", and purely speculative conclusions.

This tendency toward "paper" has completely "earthly" causes, and especially when the question concerns dissertation work. The first and, I believe, the main one is, that the "paper dissertation" is easier: one can do it without abandoning one's desk and fountain pen. One does not need equipment, nor the various, and at times hard-to-find materials for test pieces, nor the complicated and at times original instrumentation devices, which require planning and preparation.

Typically, one also notices that in scientific research institutes in the industrial sector there are also tendencies to reject laborious experimental research. As a result, the volume of reports grows but the amount of information and the effectiveness of utilization declines. It may be that the majority of the experimental research projects are being carried out right in the laboratories of the industrial enterprises. Unfortunately, in many if not most of the enterprises, which were established with the very best of intentions, the technological laboratories are either not capable of much or for all practical purposes spend most of their time working "on the plan".

The second reason is that the cadres of experimentors are poorly trained. In the VUZ programs, little attention is devoted to questions of planning, formulating and executing experimental research projects, to the methodology

of analysis of results, to laboratory equipment and apparatus, and to questions of automation of conducting the research projects. Experimental research in laboratory work is a rarity; during their practical industrial work, it is hard for the student to learn the practice of carrying out research because of the lack of laboratories at the enterprises. The number of projects leading to a diploma, which contain the results of experimental research, is declining because there are hardly any "experimentors" among the supervisors of diploma projects, and there is no way to produce them--it is a closed circle.

In the Leningrad Institute of Precision Mechanics and Optics a new trend has been established in science and technology--regularization of the microtopography of the surfaces of parts for machines and instruments. This method has turned out to be so timely, that from 150-200 enterprises appeal to the institute each year for consultations and experimental finishing work on the microtopography of the surfaces of parts of the most varied machines, instruments and apparatus.

Analysis of the content of these consultations showed that the majority of the consulting specialists have neither enough training nor experience in setting up and carrying out experimental research projects.

This tendency toward "paper", which was mentioned above, leads to serious consequences--to insufficient rates of development and improvement of technology; to a decline in the quality and reliability of machines, instruments and apparatus; to a greater amount of work for manufacturing them and to increased cost; and to delays in the actual periods of assimilating new production projects. The problem of increasing the level and the rates of development of the technology of manufacturing machines and instruments should be solved above all by virtue of expanding experimental research projects and improving them. In order to do this, it is necessary to radically expand the experimental base of the scientific research institutes, design bureaus, enterprises and VUZ's; and to increase the range of goods and the output of production of test equipment and instrumentation device. It is necessary to inculcate in engineers the taste for experimental research.

9006
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IMPROVEMENTS IN PLANNING SCIENTIFIC RESEARCH URGED

Moscow EKONOMICHESKIYE NAUKI in Russian No 9, Sep 83 pp 73-74

/Article by V. Kanin, candidate of economic sciences: "On Planning Scientific Research"/

/Text/ At the June (1983) Plenum of the CPSU Central Committee Comrade Yu. V. Andropov noted that, under present-day conditions, "the main path to a qualitative shift in the forces of production is...a conversion to intensive development, a combination in deeds of the advantages of our socialist system with the achievements of the scientific and technical revolution....

"Assuming decisive importance at this time is our scientific and technical policy."[1]

Under present-day conditions, when scientific and technical progress is the decisive factor in the intensive development and increase in the effectiveness of public production, the on-schedule introduction of scientific discoveries and inventions is capable of making genuinely revolutionary changes in production,[2] transforming and improving on a well-planned basis the means and objects of labor, the end product, technology, methods, and organizational forms of economic activity in all sectors of the socialist economy.

An important role in carrying out the unified scientific policy, in speeding up the "research--introduction" cycle, is being played by improvements in the planning of scientific research, in particular, by a step-by-step conversion to the cost-accounting system of operational organization with regard to the creation, mastery, and introduction on new equipment on the basis of supply orders. The supply order reflects the end results of a scientific project, its individual phases, and defines ahead of time the object of introducing developments.

The structure of supply orders is characterized by traits of a comprehensive, targeted program in which the composition and responsibilities of the co-performers are defined at all stages. The system of supply orders ensures the possibility of thorough planning within the framework of the "research--introduction" cycle as follows: scientific research--experimental-design projects --serial production.

Under the earlier-operating system of planning scientific research projects, scientific developments in the form of basic data for planning or working drawings used to emerge as the end result. The developers bore practically

no responsibility for the production of technical equipment. As a result of a lack of organizational coordination, the landmark indicators for introductory work were lost, and the introduction of innovations into production was delayed.

Conversion to the new system of planning and evaluating the results of scientific and technical projects facilitates the strengthening and activation of ties between the scientific-research organizations and the production line. A role of considerable importance is played herein by improvements in the system of providing economic incentives. Despite certain shifts, basic changes have not yet occurred along these lines. At the June (1983) Plenum of the CPSU Central Committee Comrade Yu. V. Andropov emphasized that we must "develop such a system of organizational, economic, and moral measures as would motivate managers, workers, and, of course, scientists and designers to renovate equipment, as well as making it unprofitable to work in an old-fashioned way."[3]

Of great importance here is evaluation of the work of the sectorial scientific research institutes and design bureaus not on the basis of the conventional economic effect but rather by the actual reduction of production costs at enterprises resulting from the introduction of the technical innovations proposed by applied science. In this connection, we must not fail to note the fact that there exist certain methodological difficulties in establishing an economic effect. As is known, it is determined in three stages: in planning, when a preliminary, guideline-type of calculation is conducted on the technical and economic grounds for justifying developments; in the ensuing, more precise work-up, when the economic effect is determined in a preliminary way, and its scope provides a basis for establishing a material-incentives fund for the period being planned; and in refining the indicator of economic effect, based upon the results of introduction.

A shortcoming of the statistical accountability now in operation is the fact that the indicators of the new equipment's economic effectiveness presented therein are most often based not on bookkeeping materials but on the guideline calculations of the specialists. This reduces the possibility of formulating exhaustive conclusions concerning the level of effect of the innovations. Analysis of the practice of bookkeeping has shown that the latter is in need of adjustment. Obviously, the accounts should reflect, above all, the real savings which the technical innovation is providing under the given production conditions. In order to compare the funds spent on NIOKR /scientific research and design projects/ with the actual yield of the new equipment, we can utilize newly opened accounts, account cards, etc.

Inasmuch as the principal source of deductions for the economic material-incentives fund of the scientific-research organizations is now profits (including the supplementary profit which is provided in the prices on new types of products in the highest quality category), there is an increase in their motivation to push developments through to the stage of serial production of technical equipment (taking into account the quality parameters and the necessity for renovating the products list). The noticeable growth during the last decade of deductions made to the economic-incentives funds by means of surcharges on new types of products has facilitated an increase of motivation among researchers and developers for increasing the serial production of new equipment and in improving the quality of the products being turned out.

Already during the 11th Five-Year Plan such important characteristics as the following were reflected in the planning of scientific-research projects in various industrial sectors: drawing up plan tasks for the entire period of development, i. e., encompassing the full "research--introduction" cycle"; furnishing a project at all stages of the "research--introduction" cycle with the necessary material, technical, financial, and labor resources; coordinating the execution of the individual stages of the "research--introduction" cycle with the investment program; the widespread utilization in research work of mathematical equipment, computers, etc.

At the same time, the practice of planning scientific research testifies to the continued persistence of definite shortcomings and omissions. In particular, many ministries fail to conduct systematic and targeted work with regard to forecasting the development of science and technology in sectors of the national economy, and this delays the working out of long-term plans for scientific-research and experimental-design projects. Lack of scientifically well-grounded, prospective planning for NIOKR frequently leads to the unjustified practice of forming portfolios of research studies entirely upon the initiative of the scientific organizations carrying them out; the latter are not always correctly oriented in the strategy of the scientific quest, in implementing a targeted, rational, and effective technical policy in the sectors. Furthermore, such a practice also exacerbates such entrenched shortcomings as the multiplicity and petty nature of topics, unjustified duplication in research, and ineffective distribution (redistribution) of resources to the various scientific organizations carrying them out. A serious retarding influence on the development of scientific work is exerted by the fact that often projects which are small in scale but which provide a quick effect are more advantageous for researchers than large-scale projects with greater prospects and scope. This is to be explained by the fact that, for example, in nonferrous metallurgy and a number of other sectors the size of the incentive decreases as the effectiveness of the developments increases; in other words, the greater the effectiveness of the developments, the less is the percentage of the deductions allocated to the incentive funds for scientific-research institutes. As a result, there is a decline in their motivation to solve the key problems of scientific and technical progress.

The "abundance" of developments (not always urgently needed) leads to a situation whereby many of them do not reach the stage of introduction. Frequently such a situation is also to be explained by the limited nature of the investment resources, the lack of an experimental-technical center, etc. The consequences of this situation include a large number of unexamined and unintroduced developments, a growth of non-productive outlays, and extremely tangible psychological losses.

At the same time, the practical operational experience of many scientific-research institutes and design bureaus has shown that the principles of providing cost-accounting incentives for scientific-research and design projects cannot be applied everywhere or to all research studies. This pertains primarily to theoretical and research studies which frequently turn out to be of little prestige and are allotted last place in the plan for scientific-research work, even though it is precisely they which allow the developmental directions of the sectors to be determined. The cause of this state of

affairs consists in the fact that the determining indicator of a scientific-research institute or a design bureau is its effectiveness as calculated per ruble of outlays, but theoretical and basic research measured by such an evaluation is artificially condemned to ineffectiveness. In our opinion, each scientific-research institute should have a scientific inventory of projects in progress and hence be obliged to strive to develop intensified plans for scientific-research work based on the optimum combination of pure research and applied projects.

Further improvement in the practice of planning and providing incentives for NIOKR, in our view, requires a more active orientation, aimed at the universal use of all elements of forecasting and, on this basis, developing prospective plans for scientific research with the aid of such progressive planning methods as the balanced, normative, program-targeted, and others. We need a more precise procedure for planning the economic effectiveness of scientific-research developments, as well as the establishment of better grounded norms for deductions made to the incentive funds. We must make more extensive use of rational forms for organizing all the work of scientific-research institutes, design bureaus, and PKO's /planning and design departments/; we must also practice, to a greater degree, a step-by-step, expert evaluation of research studies. We need to improve the system of the recruitment and optimum distribution (redistribution) of research personnel, and, in case of necessity, attract into scientific-research institutions highly qualified specialists for carrying out projects which are of particularly great importance.

FOOTNOTES

1. "Materialy Plenuma Tsentral'nogo Komiteta KPSS 14--15 iyunya 1983 goda" /Materials of the Plenum of the CPSU Central Committee, 14--15 June 1983/, p 10.

2. See "Materialy XXVI s"yezda KPSS" /Materials of the 26th Congress of the CPSU/, Moscow, 1981, p 43.

3. "Materialy Plenuma...", pp 10-11.

2384
CSO: 1814/49

WIDER USE OF INSTITUTE RESEARCH INNOVATIONS URGED

Moscow PRAVDA in Russian 27 Sep 83 p 2

[Article by F. Dolzhenkov, director of DonNIIchermet [Donetsk Scientific Research Institute of Ferrous Metallurgy], honored scientist of the UkSSR, doctor of technical sciences, and professor: "Not Repeating Covered Ground"]

[Text] The CPSU Central Committee and USSR Council of Ministers decree "On measures to accelerate scientific and technical progress in the national economy" is oriented toward radical improvement in this work in the light of the decisions of the November (1982) and June (1983) Plenums of the CPSU Central Committee on problems of basic improvement in labor productivity based on the broad and accelerated introduction into practice of the achievements of science, technology and advanced experience.

The weighty opinion here belongs to the sectorial scientific research institutes. Not all of them are making a sufficient contribution to progress in their own field of technology, of course. But the fruits of efforts by collectives which have considerable work in progress for introduction do not always find their way into practice right away, either.

Among the many indicators which characterize the work of the NII [scientific research institutes], three (yield per ruble of cost, duration of the research-introduction cycle, and finally, the level of scientific developments, determined by patents obtained for inventions and licenses sold) tell especially clearly how one collective or another is coping with the tasks set for it. Only the harmonious and best combination of them yields the gains that are due. So that their fulfillment, it is not difficult to note, does not depend on scientists to an identical degree. I will demonstrate this in the example of the Donetsk NII of Ferrous Metallurgy.

For a relatively short period of time--it was created in the 1960's--the DonNIIchermet has held one of the leading places in the sector. The institute has been associated with broad assimilation of blast-furnace smelting technology for the combined blasting of large parameters [kombinirovannoye dut'ye vysokikh parametrov], using natural gas, fuel oil, and coal-dust fuel; the application of nonblast-furnace desulfuration of pig iron; intensification of open-hearth smelting by blowing through oxygen; assimilation of heavy-capacity converters and the production technology of hot-gauged [goryachekalibrovannaya] steel; and organization of rolled metal output in accordance with theoretical volume.

Long-range basic research oriented toward the creation of fundamentally new technological processes has been conducted at the same time. The work which was carried out made it possible for the institute to begin introducing, at the beginning of the 10th Five-Year Plan, the results of large-scale research efforts capable of exerting a noticeable effect on the technical and economic indicators not only of individual enterprises, but in the sector as a whole. In those years, the technology of flare guniting of the refractory lining in oxygen converter shops was "in wide use" [shiroko "poshla"], thanks to which record durability in a converter refractory lining--more than 2,500 smeltings--was achieved at the West Siberian Metallurgical Plant. At the Karaganda Metallurgical Combine the largest fluidized-bed furnace in the world for roasting limestone was put into operation. At the Donetsk Metallurgical Plant, the first industrial installation for injection of coal dust into a blast furnace, which makes it possible to save 10-20 percent of the coke, was built.

The economic gains from introducing the fruits of scientific efforts into production have been steadily increasing. Last year the yield per ruble of cost amounted to about 4 rubles. The institute's recommendations are finding more and more acceptance not only in our country but abroad as well: five licenses have been sold to foreign firms.

Nevertheless, only a part (and a small one) of the scientific and technical work done by the institute has been reflected in end results. It has been estimated that the sector's utilization of the results of our efforts in the real volumes proposed would yield additionally more than 230 million rubles annually, would substantially increase the production of cast iron, steel, and rolled metal, and would save 1.7 million tons of coke and 1.3 tons of metal.

The highly efficient innovations mentioned (as well as others) were introduced in a single copy, so to speak. Delays in their wide assimilation, as a rule, are explained by the lack of capital investments allocated. This is how it is counted, after all!

It is no secret that often large metallurgical projects being erected are based on technology and equipment which have been used for many years, even if more advanced technology and equipment have been developed and approved by scientists under industrial production conditions. It is believed that obtaining the product needed is guaranteed this way. But expenditures for its production, both one-time capital and the operational expenditures which follow, apparently have no significance. Meanwhile, repeating covered ground quite often is more expensive than introducing that which has just been discovered. So is the problem shortage of funds? More of them are spent as a result.

Examples? Certainly. Let us take the same fluidized-bed furnace for roasting converter lime. The single-unit capacity of this unit is 1,000 tons of lime in 24 hours, 2.5 times more than with the largest rotary furnaces, and the relative capital expenditures are one and a half times less as a minimum. The fact that with identical quality indicators for the lime, the fluidized-bed furnaces consume 25-30 percent less fuel also is very important. So that in the 1976-1982 period, more than 10 lime-roasting furnaces were built at the

sector's enterprises, but...not one of them in accordance with the technology proposed by our institute. If arithmetic is used, it turns out that for the money spent, capacities one and a half to two times larger could have been introduced and a vast savings in fuel could have been ensured.

With a rational approach to the funds now being allocated, I am certain, many more projects could be built. But it is not that way! And for the long term in planning studies for a number of metallurgical plants, units which do not stand up to competition evidently have been incorporated. The economic advantages of constructing fluidized-bed furnaces at plants which have converter and sintering production are so appreciable that the erection of rotary furnaces should be repudiated. Taking this into account, the problem of constructing lime-roasting units for "Azovstal'," "Krivorozhstal'," the Lipetsk plant and other metallurgical plants should be resolved.

Careless expenditure of allocations is encountered not really so infrequently. Here is such an example, let us say. In recent years, methods of processing steel outside the furnace (ladle metallurgy), for which slag of a definite composition is needed, in particular, have been used more and more widely. It may be obtained by different methods. Naturally, each one of them has advantages and disadvantages. Commonsense indicates that selection of one or another depends on the specific production conditions. Unfortunately, at times they are not taken into account.

In planning the oxygen converter shop of the "Azovstal'" plant, the method of processing steel with liquid synthetic slag was used. This process is well known and its effectiveness in practice has been proved many times. But it has significant drawbacks, too: specific electric furnaces are needed (and there are sizable work areas), and the cost of it is high as well. So for the first section of the "Azovstal'" oxygen-converter shop, an electric slag-smelting furnace had to be built in the place intended for a third converter.

This is a half-and-half decision. The difficulties which will arise in the future when production is expanded are so apparent that a question suggests itself: was it really possible to avoid them? However, a response is also ready: it was possible. With significantly less capital expenditures at the same time. Such an opportunity is provided by using the technique of burning self-fluxing slag mixtures in a steel-pouring ladle before the smelting, which was developed in the DonNIIchermet. The new technique can be used in any operating shop. The installations for drawing off and scrubbing gases are small and inexpensive. But in the construction of the complex of the "3000" mill at the Zhdanov Plant imeni Il'ich, a variation of processing steel with slag smelted in slag-smelting furnaces also was adopted. Although, according to findings of the Zhdanov branch of the Ukrgipromez [Ukrainian State Institute for Planning Metallurgical Plants], capital expenditures in this case were twice as much as when self-fluxing slag mixtures are used (39.6 million and 20 million rubles, respectively).

Further examples such as this may be cited, unfortunately. Their number, it seems to me, has been predetermined in many respects by the fact that in our sectorial planning a single system of scientific and technical progress indicators is not being used in its different stages. Hence the stages are also deprived of a unified singleness of purpose. There is practically no effective coordination between the plans for scientific and technical progress and other sections of the plans for the economic and social development of enterprises.

To begin with, the system of formulating the plans for introduction require improvement. Practice demonstrates that in their preparation economic criteria are inadequately taken into account, there is no aimed selection of measures at most plants to ensure fulfillment of targets in accordance with an increase in production, savings in material resources, and reduction of production cost.

In allocating financial means for development of science and technology, the actual effectiveness of the different directions of scientific and technical progress in the sector are practically not taken into account. The general trend in the expenditure of funds for measures in accordance with new technology is to reduce the proportion of expenditures for advanced technology, mechanization, and automation of production. Disregarding demands for economy in selecting measures for inclusion in the plan leads to a situation in which a significant part of them (approximately 10 percent at metallurgical plants in the Ukraine, for example, in the last five-year plan) do not yield the gains envisaged by the accepted standard.

In my view, the directions for technical development on the sectorial level are not always selected correctly, either. Thus, in the 1973-1978 period, approximately three-fourths of the increase in the output of cast iron was provided by the introduction and renovation of blast furnaces, according to the UkSSR Ministry of Ferrous Metallurgy. Meanwhile, calculations indicate that the most economical way in a given stage is not construction of units which do not provide a reduction in production cost and capital-output ratio, but primarily improvement in the quality of the iron ore mixture. The increase in the yield of each million tons of cast iron owing to this makes it possible to justify expenditures for less than 4 years and to obtain 39 million rubles of savings, compared with the introduction of new furnaces.

Shortcomings in the introduction of the results of scientific efforts first of all require organizational measures which are conducive to the rapid advancement to production of the most effective innovations. This will become a mighty lever for the most sensible utilization of the country's production and scientific and technical potential.

8936
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COMPUTER WORKLOAD POLICY DISPUTED

Moscow SOVETSKAYA ROSSIYA in Russian 10 Nov 83 p 2

[Article by G. Zhavoronkov: "The Situation Following a Letter"]

[Text] The ink of the registration number had hardly dried on the letter but the telephone rang in the editorial office and an authoritative voice declared that everything presented in the statement from beginning to end was untrue and the author disavowed it. A responsible person was calling--the secretary of the party organization of the Institute of Oceanology imeni P. P. Shirshov of the USSR Academy of Sciences, V. I. Byshev.

Later the writer of the letter himself telephoned--I. A. Fedorov, systems programmer at the institute, and asked that his statement be considered valid.

On one hand, there were no reasons not to believe the assertion of the party bureau secretary, but on the other hand, I. A. Fedorov's statement did not contain some kind of personal story, but anxiety about the regular nonfulfillment of state norms for the EVM [computer] workload (as a result of which thousands and thousands of rubles are lost), and about the methods of administration in managing the institute, which does not take specialists' opinion into consideration.

The first meeting with staff members of the Institute of Oceanology had already convinced us that I. A. Fedorov's letter was just a small spark of a raging production fire. In order to understand its causes, we needed to return to early spring from late fall--to the May meeting of the party bureau on the same question about the effective use of computer equipment.

In fact, this problem was raised then by the production sector more thoroughly and acutely than in I. A. Fedorov's letter to the editorial staff. In a decision approved unanimously by the party bureau, it was recommended that management quickly shift the EVM to three-shift operation.

An ordinary meeting of the party bureau, and the usual, it would seem, resolution dictated by concern for the status of scientific research.

Thunder and lightning burst forth for 2 weeks at a scheduled meeting. After discussing plan matters, Secretary V. I. Byshev asked for several more minutes of attention and proposed... that the previous bureau's decision be rescinded as "raw and unprepared." And the decision, after stormy debates, was rescinded by seven votes to four.

Just what took place in such a short period of time? What could so abruptly change the position of the party leadership? Perhaps by this time all the existing shortcomings in the work had already been eliminated? If they had been. But unfortunately everything was far from that. A. S. Monin, the director of the institute, simply was absent at the first meeting of the bureau, but he took part in the second one.

Disaffirmation of a decision approved earlier is a step which in itself is not ordinary, but possible. It is understandable that it requires the appropriate explanatory work among the communists. Especially if the initiative for this step comes from the director. Now, after time has elapsed, it may be said that the explanations were niggardly and not very persuasive.

Meanwhile, on 20 June an order on computer equipment came to the institute from the USSR Academy of Sciences Presidium, signed by Vice President Ye. P. Velikhov, in which Director A. S. Monin was rebuked for nonfulfillment of the state norms for computer workload. Logically, such a warning signal (one more!) should have become the subject for the most expeditious examination and decision both for the institute management and for its party organization as well. But precisely logic had been lost by this time.

Deputy Secretary Ye. G. Mirlin handed in a statement in which he accused the director of pressure on the party bureau, suppression of criticism and incorrect relations with public organizations. But at a special meeting the director handed in a counterstatement accusing Ye. G. Mirlin and V. P. Keondzhyan, a member of the production sector, of conduct unbefitting party members, based on the fact that they did not familiarize him with a draft of the decision of the May meeting.

The commission which examined both these statements beforehand recommended that they be "recalled" in the name of the party bureau's unity and normalization of its work. Such a decision was approved with the suggestion that moral lessons be learned from what had happened.

But lessons were not learned. Shortly after, the institute management succeeded in signing in the Academy of Sciences Presidium a formal document which made it possible for them not to extend state norms on computer workload to machines existing in the computer center. (Later these actions of the administration will be acknowledged to be tactless, to say the least). Such a decision automatically turned critics of the director into typical complainers and squabblers. But all subsequent commissions, running up against an authoritative formal document, threw up their hands: in the final analysis, they say, it is more apparent to the Academy of Sciences Presidium how to more efficiently utilize computer equipment.

Meanwhile, life at the institute was far from taking its normal course.

Not long ago the successful laboratory of V. P. Keondzhyan, which was laying claim to a prize position in socialist competition in accordance with the results of 1982, began to be considered unsuccessful. Beginning in May 1983, threatening orders began appearing on its work--an average of one per week. And finally on 19 June, V. P. Keondzhyan himself was relieved of his functions as chief of the laboratory. Some of his associates soon forfeited personal raises and became aware of severe economic sanctions. Frequently without the necessary explanations besides. For example, until now, in spite of repeated appeals to the party bureau, M. I. Kabanov, chief engineer of the mathematical modeling laboratory, has been puzzled about the reasons for his punishment. Some persons' statements were considered as the first order of priority, but some persons' statements were not considered at all.

The situation which was created, of course, has not contributed to scientific research. I fear that at this time only the dispute committee has been working at full strength, investigating countless complaints. Their number could compete well with the number of thick volumes of scientific research.

The lengthy conversation with Secretary V. I. Byshev did not give hope for a most rapid change in the situation that had been created. As before, he saw the cause of the dispute in the particular qualities of the opponents of the management. As proof, examples were produced from 1982 and even 1981. They were as long ago as then, he says... And the question automatically arose: if they were "as long ago as then," why had these persons been elected members of the party bureau, and why hadn't Byshev himself opposed their candidacy? Whether Byshev had wanted this or not, the chronology of his "principled approach" unfortunately begins with the May meeting of the party bureau.

In the process of the conversation the secretary stressed several times that the subject of the dispute was so complicated that only competent persons are capable of understanding and resolving it. I could not disagree with this and directed attention to the findings of the commission of the USSR Academy of Sciences on full verification of the use of computer equipment operating in the institute from 8 September to 11 October 1983. There are only three points in its recommendations: require the institute to shift the EVM to around-the-clock operation, to centralize service, and to discontinue the practice of renting machine time on the side.

The recommendations were confirmed by Ye. P. Velikhov, vice president of the USSR Academy of Sciences, with instructions to the director of the Institute of Oceanology: "Please give an explanation of the problems noted in the formal document." But haven't these three questions really become a stumbling block for the institute's party organization? Hasn't such a solution of the problem really been demanded by those communists who are now being called disturbers of the peace?

Having influenced the party bureau's decision by a determined effort, the institute director unwittingly put himself in the position of one literary hero who demanded that a certain continent be closed because he had not personally taken part in its opening.

There is one way out of this situation--the administration must understand to the end that party control always has been and remains the most important means of affirming intraparty democracy, the struggle with violations of official ethics, and any manifestations of abuse of one's official position. And in the situation which developed, communists used their statutory right of control over the rational allocation and utilization of scientific forces and physical assets, and they deserve to be supported.

The story which took place in the Institute of Oceanology may appear to be a private situation. It has to be noted, however, that situations like this become possible wherever and whenever personal ambitions are held above the interests of the work, where a principled approach is substituted by striving to conceal shortcomings, and wherever just criticism is perceived as a blow to the prestige of managers. For this reason, both the institute administration and the party bureau must first of all create in the collective an atmosphere of trust and exactingness, so that criticism leads to the most expeditious solution of a problem, and not to the next "production fire."

8936
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SCIENTIST CITES NEED FOR WELL-TRAINED LABORATORY TECHNICIANS, ASSISTANTS

Moscow KOMSOMOL'SKAYA PRAVDA in Russian 10 Nov 83 p 2

[Article by A. Starodub, scientific secretary of FIAN, laureate of Leninist Komsomol Prize, delegate to 19th Komsomol Congress: "Technicians for Scientific Research Institutes: How to Improve Training of Cadres for Academic and Scientific Research Institutes"]

[Text] They often say that science is a costly business. And not only by the results--one way or another we all enjoy the fruits of scientific-technical progress. The degree to which modern science is equipped must correspond with the complex problems which it is called upon to solve. For this purpose powerful telescopes have been developed, accelerators, and unique apparatus--which help us to acquire new knowledge. And of course, this question cannot be separated from the problem of the effectiveness of science.

At the Physics Institute of the USSR Academy of Sciences [FIAN], a system for training young scientific cadres has already taken shape. It is based on cooperation of the institute with the scientific departments at MGU [Moscow State University], MIFI [Moscow Engineering Physics Institute] and MFTI [Moscow Physicotechnical Institute], at which the leading scholars of our institute are instructors. And the students, in turn, from the third year on, have the opportunity to participate in scientific experiments at FIAN's laboratories. This matter is already settled; it has received recognition and has spread. But I would now like to focus attention on another matter.

More and more often we are encountering a paradoxical situation: a system has been developed for training scientific cadres, and--it's a sin to complain--every year capable young research fellows come to the institute. But...they are often forced to do routine work. A questionnaire which we circulated not long ago in the institute showed that young scientists spend about a fourth of their work time on occupations which could be performed by less-skilled research assistants. And they will be forced to do this until such time as the required number of skilled technicians arrive, who know the particulars of working in scientific institutions, and who are not lost at the sight of complex equipment, without which modern experiments in physics are not possible. On the other hand, in order to speed up introduction of scientific research and manufacture of experimental prototypes of our products, there is also an acute need for workers who have been specially-trained for an academic scientific research institute.

Thus, we are speaking of an urgent task--training technicians, laboratory assistants, and workers to serve modern science. Science, I repeat, is costly. After all, one who creates and operates unique equipment must be a master at his trade. But for the time being, unfortunately, the problem is being solved spontaneously. In the system of the Academy of Sciences there is no special educational institution--there is neither a technical secondary school, nor a vocational-technical school which could train the specialists which are needed.

And what if such an institute were created, as a start, in the system of the USSR Academy of Sciences? The Komsomol committee and the council of young scientists and specialists at our institute are ready to sponsor them.

9006
CSO: 1814/57

PRACTICAL INTRODUCTION OF VUZ SCIENTIFIC ACHIEVEMENTS SURVEYED

Moscow SOVETSKAYA ROSSIYA in Russian 30 Nov 83 p 3

[Article by A. Glovatskiy, candidate of technical sciences: "The Long Road of Innovation. How To Increase the Effectiveness of the Contribution of VUZ Science in the National Economy"]

[Text] Moscow--It is noted in the recently adopted CPSU Central Committee and USSR Council of Ministers decree "On Measures To Accelerate Scientific and Technical Progress in the National Economy" that in some sectors poor use is being made of the scientific achievements of academic and sector institutes and also of the country's VUZ's. I consider it my duty to express some ideas on this subject since I have been involved for several decades in the development and industrial introduction of new technological processes.

I know that the proportion of work at a low scientific and technical level is still very great. Much reseach is still conducted in accordance with less important private orders from plants and factories. And I therefore also realize that the VUZ potential for solving very important scientific and technical and socioeconomic problems is still being far from fully used. But I want to talk about something else: why is it that even highly effective scientific developments are introduced so slowly, and indeed, why some of them never see the light of day at all?

The story of the introduction of a new method for obtaining nonferrous metal from ore in a furnace with a liquid slag bath, developed at the Moscow Institute of Steel and Alloys is indicative. This advanced technology is now at the center of attention in the scientific organizations and the firms and companies of many countries in the world. The VUZ scientists achieved deserved success. This must be a cause for satisfaction. The only pity is that the scientists wasted more than 25 years proving the advantages of the new method!

The pro-vice-chancellor for training and scientific work at the Moscow State University, doctor of physicomathematical sciences professor Viktor Antonovich Sadovnichiy also talks about similar cases:

"Today production needs unprecedentedly enormous amounts of ozone. It helps to treat effluent and waste from industrial enterprises by removing harmful substances. A new ozone maker was produced at the university. Its productivity

is 50 to 100 times greater than existing models, and capital investments to produce it are 10 to 15 times less. However, despite everything that we have done in the past 20 years to implement the innovation in production, the plants are still producing the old models".

There are many such developments. They are all taken into account and beautify innumerable accountability documents, certificates and proposals to interested ministries and administrations and the USSR State Committee for Science and Technology and the Gosplan. But why do these beautiful and very promising lists not become new machines and equipment, technological processes and operations that are so needed today in the national economy? What are the reasons for this state of affairs?

There are many reasons. The chief one is the lack of a clear, regulated procedure for considering proposals from the Ministry of Higher and Secondary Specialized Education on the introduction of complete developments. Today the ministry is instructed to send them to the interested sectors, the Gosplan, the State Committee for Science and Technology, Gosstroy, Gossnab and other organizations. Many of them have only a formal attitude toward this kind of review and some fail completely to respond to proposals from the Ministry of Higher and Secondary Specialized Education. A special commission was set up several years ago to coordinate these actions. However, there is no strict procedure for reviewing proposals on introduction and the commission does not have the deciding vote.

All this is leading to the loss of valuable developments along the road of regulation and coordination, particularly in the ministries and administrations where they try to exlude those that might cause any extra fuss, are not fully supported materially, or that are accompanied by difficulties in "entering" them in existing technological schemes. But even after a prolonged "shakedown period" there is no 100-percent guarantee that recommended innovations will be included in the state plan. Up to now, for example, no one knows the fate of almost 250 proposals drawn up by the Ministry of Higher and Secondary Specialized Education during 1981 and 1982.

Another reason is the lack of material incentive for enterprises to introduce innovations. "Outside" developments are used very reluctantly for this reason. Sometimes plants begin to "clutch" at old, long since obsolete technology because it is their own. Then the road to anything new is closed for a long time. As a result, the funds spent by the state in science become "frozen assets."

Introduction is often delayed because of the weakness of the design and production base at some VUZ's. This makes it impossible to bring a development up to the level at which it could be passed on to the sector organizations and enterprises in a finished form.

There is also the, in my view, unhealthy practice whereby certain institutes begin by offering their proposals for sale abroad.

The managers of the "Litsensnauka" firm in the all-union "Litsensintorg" association have complained that 70 to 80 percent of developments by VUZ,

sector and academic institutions that now negotiate with foreign firms for the purchase of licences, are not extensively introduced. It is quite obvious that it is not profitable to sell developments that have not been brought up to the introduction stage. Again, in the final analysis the state is the loser. And in general, is it rational to sell inventions that have not been realized within the country?

Instances in which Soviet developments are introduced more rapidly in other countries than here are not so rare. This happened, for example, with continuous steel casting.

Eight years ago the West German firm Schlieman-Ziemag was sold a drawing-rolling technology by the Chelyabinsk Polytechnical Institute. Today that firm has introduced it and is making enormous profits. But in practical work here, even the experimental industrial model of the new technology has not been brought to its logical conclusion. Why are those guilty of doing direct harm to our economy not strictly brought to account?

I am not against trade, including the issuing of licences. But things should be set up in such a way that the innovations developed in our country should first bring profit for our national economy. It is essential, it was stressed at the CPSU Central Committee June (182) Plenum by CPSU Central Committee general secretary Yu.V. Andropov, "to insure the most judicious use of the country's production and scientific and technical potential." Many of the promising undertakings in this direction have been underpinned in the party and government decree to which I referred at the beginning of this article.

Some conclusions. I think that it is necessary to abandon the practice of allocating funds for the development of science and technology between the sectors in accordance with the principle of "all things to all men," since as a result, instead of introducing new directions in the development of sectors and major domestic developments, what often happens is that the "holes are patched over" and only those developments that do not require great effort are realized. Funds must be allocated for the development of specific, progressive directions and the introduction of major scientific developments. And here, I think, we need an organ similar to the State Committee for Science and Technology commission, which would coordinate such actions, organize interdepartmental testing of innovations, set up sector commissions, and finally, determine a clear procedure for the examination of introduction proposals. And the main thing is to require fulfillment of its decisions by the sectors and administrations. Thought should be given to the powers that it should enjoy.

Organizational measures should also be underpinned with qualitatively new material incentive. And they should be the kinds of incentive that not only favor simple introduction of an innovation but also stimulate the struggle to be first to do it and to seek out innovation by recruiting the authors into the process of introduction. I am convinced that it is not so difficult to do this. One has only to see the final goal of such innovations. On the other hand, it is essential to set up a unified system for allocating funds from the real economic effect achieved from the introduction of VUZ developments to a special material incentive fund for those participating in the work.

These kinds of measures will exert the most influence on reducing the lead times for the introduction of innovations.

There is one more aspect to the problem. The opinion is often heard that a scientist's business is only to generate ideas, while introduction should be handled by the producers. I suggest that the scientist should not be freed from concern for the introduction of his own developments. On the contrary, such activity should be encouraged in every possible way and he should be given the opportunity to experience that unusual sense of joy and pride in the results of the logical culmination of the creative process.

One thing is clear: a straight new road should be laid for the introduction of VUZ scientific developments, and the traffic lights at the intersections should always be green.

9642
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ANDROPOV CITES NEED TO INTRODUCE MODERN MANUFACTURING TECHNOLOGY

Moscow IZVESTIYA in Russian 3 Nov 83 p 1

[Article: "Topic of the Day: Consummation of the Quest"]

[Text] Introduction to production is the consumation of the scientific and technical quest. And why are there not a few new machines, machine tools, consumer goods, and progressive ideas for organizing and controlling production, which are still located midway between the blueprints and the actual operating model? Why, for example, is the USSR Ministry of Ferrous Metallurgy completely unable to solve a problem which is extremely important for the country: how to utilize coke more effectively? There already are installations for introducing hot gases into a blast furnace. But the "Tulachermet" NPO [Scientific-Industrial Association] is completely unable to put them into operation. And in connection with this, an additional 50,000 tons of coke and 25 million cubic meters of natural gas are used each year. The technology already exists by which one can utilize pulverized coal as fuel when smelting pig iron: the coal dust is blown in, and every kilogram of the dust results in a saving of 700 grams of coke. But this technology is being introduced at an extremely slow pace. If the temperature of the blasting is increased by 10 degrees, we save nearly 1.3 kg of coke for every ton of pig iron. But the ministry is not in a hurry to raise the temperature.

There are quite a few reasons which hinder speeding up the introduction of new things in our life. Here, for example, is one which is very typical: There is age-old competition along the fringes of industry and science. Scientists complain to the enterprises which do not want to introduce their ideas, of which a single model has been manufactured, into serial production. And the administrators of the enterprises complain that the scientists propose new things to them without any consideration of the real conditions for production. But you see, an experimental installation and an article going into serial production, are different things. New requirements crop up along the way from model to serial production--such things as reliability, durability and economy.

Is there a way out here? Yes, there is. Science and industry must build their bridges to meet one another. And we already have experience in this: for example, the cooperation of the Institute of Arc Welding imeni E.O. Paton of the USSR Academy of Sciences, with industry. Such splendidly-built bridges are represented by the cooperation of MGU [Moscow State

University] and MVTU [Moscow Higher Technical School imeni N.E. Bauman] with "AvtoZIL" [expansion unknown]; and the scientists of the Belorussian and Lithuanian Academies of Science with the national economies of their republics.

This is fine, if there is a mutual desire to meet one another halfway. However, one desire is not enough. We known that quite frequently a paradoxical situation still occurs: society as a whole would profit from introduction of something new, but a given enterprise would not.

In his speech at the June (1983) CPSU Central Committee Plenum, CPSU Central Committee General Secretary of our party, Chairman of the Presidium of the USSR Supreme Soviet, Yu.V. Andropov, stated that it is necessary "To develop a system of organizational, economic and moral measures which would interest both the administrators and the workers in introducing new technology, and of course the scientists and designers as well; that would make it unporofitable to work with the old technology; this is what the task consists of".

This task has been assigned to Gosplan USSR, the USSR Academy of Sciences, and the USSR State Committee for Science and Technology. It would be good to speed up its solution as well--and to put the results of this decision into practice sooner.

9006
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KAPITSA INTERVIEWED ON FORECASTING

Moscow IZVESTIYA in Russian 20 Nov 83 p 3

[Interview with Professor S.P. Kapitsa by Kim Smirnov: "The Forecast is History Pointed at the Future"]

[Text] The ancient Indian kingdom of Kalinga was famous for its philosophers and scholars even before the new era. Since then the name of that country has become a symbol of interest in science and culture. Each year UNESCO awards the Kalinga prize for the most outstanding results in the publicizing of science. The laureates include L. de Broglie, B. Russell and A. Clark and other scientists and writers of world reknown. Academician S. Kapitsa was the second Soviet recipient of this prize, after academician A. Oparin. Author of works on hydrodynamics, magnetism, electrodynamics and accelerators and on the use of synchrotron radiation, senior scientific associate with the Institute of Physical Problems of the USSR Academy of Sciences, head of the General Physics Department at the MFTI [Moscow Physico-Technical Institute] and holder of the State Prize of the USSR, he has become famous throughout the Union as the director of the television science program: "The Obvious is the Incredible." We decided on the subject of our discussion: predictions--those which have come true and those which have not. Out conversation turned to other subjects, however--the publicizing of scientific information and its role in the shaping of the individual.

[Question] Sergey Petrovich, right now, when mankind is increasingly preparing itself for the beginning of a new millennium, various types of predictions as to what people, cities, automobiles, airplanes, television sets and so forth will be like 10, 25, 50, 100 years from now are once again becoming popular. For example, we are proud of the fact that in his consultation on a science fiction film about a flight to the Moon, Tsiolkovskiy accurately predicted man's method of traveling on its surface. Why do we forget about the predictions which did not come true, however? Could we not benefit from the study of these?

[Answer] Niels Bohr once jokingly said that it is difficult to make forecasts and especially difficult to predict the future. It is not even a matter of whether the predictions do or do not come true, however. The important thing is that they organize thinking and force people to think about the future. A forecast is history pointed to the future, an important element of public awareness.

There are entire areas of our life--the educational system, for example--which structure all their work around forecasts: what knowledge and skills the society will need when today's first-grade students and freshmen complete the schools and VUZ's.

Let us return to the predictions which do not come true. Any research project includes experiments which produce a negative result. A negative result in an unknown area constitutes new knowledge, however. Furthermore, the "tree" of forecasts which do not come true sometimes generates "branches" of extremely interesting achievements--though it may be in an unexpected direction.

Take the Ostankino Television Tower, for example. Its history goes back a very long way, to the time when its designer, N. Nikitin, created the plan for a grand wind-driven motor in the Crimea. I do not think that he thereby resolved the energy problem as we see it and are resolving it today. It was important for him to create a tall, concrete tower, however. And the solution to this problem led to the construction of an architecturally and technically outstanding structure.

[Question] I would still like to know which of the forecasts which did not come true interest you the most, however.

[Answer] The GOELRO [State Commission for the Electrification of Russia] plan, when it was being conceived. Russia was in a very impoverished state, and the creators of this plan were called dreamers and idealists. In fact, however, this was a realistic program with a very far-sighted view to the future. It has a practical, planned side which was embodied in the development of the Soviet Union's power engineering. It also has a more profound philosophical basis. It is based on a world outlook, it you like. It was precisely then that the role of power engineering in the society's policy and life was defined and officially established. Today, following the energy crisis in the West, this role is apparent to all. V.I. Lenin, the founder of our state, foresaw all of this even then, however, during the first years of Soviet power.

Here is another example. V. Bernadskiy's "Ocherki i rechi" [Essays and Speechs] is kept in Vladimir Il'ich's Kremlin office. It contains a prediction of nuclear energy's influence on the future of mankind. The author even asked whether mankind was mature enough to receive with awareness the great force which the mastery of atomic energy would put into its hands. These lines would appear to have been written today, and not more than 60 years ago, when only the first steps had been taken toward the creation of nuclear physics.

After the war, in 1946 and 1947, a group of scientists headed by S. Vavilov compiled a forcast for the next 15-20 years under a government assignment. This is a very interesting document. For example, it contains a prediction of the place semiconductors would assume in tomorrow's (now today's) technology. This section was written by A Ioffe.

Such documents are still extremely instructive today for those scientists responsible for forecasting our future in the field of science and technology.

In my opinion, it is important to condense the forecasts to a very small number of the most important points. The Scientific Council on Problems of Scientific and Technological, Social and Economic Forecasting of the Presidium of the USSR Academy of Sciences and the GKNT [State Committee for Science and Technology] have performed work the summarization of which would require dozens if not hundreds of volumes. It is also very important, however, to have the quintessence of this gigantic volume of work on 10 or 20 pages. These would single out the main points which could be absorbed by each individual so that the forecast would truly become a part of the public awareness.

Incidentally, the main forecast which should occupy our minds today is the responsible and profound handling of the development of information science, of computer technology and the entire group of problems related to automation and robotics, with the shifting of the most simple "reasoning" functions to machines, that which is broadly referred to as the creation of artificial intelligence.

[Question] Does this mean that in time the memory banks of the electronic computers will replace libraries?

[Answer] To a certain degree, it does. Basically, however, this is like asking whether painting would be destroyed by photography and the theater by movies. Records did not disappear when tape recorders came into being. We make very significant inscriptions on stones just as this was done 5,000 years ago, despite the availability of xerography machines (kseroksy) and various high-speed printing equipment.

[Question] We now have an abundance of literature on the last 5-year plans. Why then, do we still not have a book, equally popular and equally strongly implanted in the public awareness as "Rasskaz o velikom plane" [An Account of the Great Plan] by M. Il'in?

[Answer] The answer is very simple. We need to work on this more seriously.

It was proposed that the scholars make a forecast of global development to the year 2017, the 100th anniversary of the Great October Socialist Revolution. Research centers which engage in forecasting on a global scale are popular in the world today. These include centers like the "Roman Club." They very extensively publicize their conclusions, which are frequently subordinated to completely specific class interests and goals. We should probably give some thought not only to participating in the work of such organizations, of defending our own positions, but also of creating our own, socialist "think tanks" for developing and publicizing our ideas on global problems. Finally, forecasts and the development of news of the future could become a fine subject for international discussion on those television "bridges" which are now being built.

We need to be more active in our search for new ways of publicizing scientific and technological progress.

The Polytechnical Museum was once a great center of culture. It has now turned into a provincial institution in the center of the capital, however. Its lecture

series are popular. Why has the museum itself not become an attraction like the Tretyakov Gallery or the Historical Museum, however? Why are half of the premises occupied by offices of the "Znaniye" society and other institutions.

We must reorganize the museum. Perhaps if we should eliminate its conventional division into sections for power engineering, metallurgy, automation, chemistry and so forth, especially since modern science and technology are fairly well publicized by the departmentally arranged VDNKh [Exhibition of Achievements of the National Economy of the USSR]. Perhaps we should single out the two main directions in the exhibition: man in the modern world and global problems as a synthesis of that which surrounds and influences him. It is time to demonstrate that science and technology, the tools of understanding and labor, serve man, people, the society, and not esoteric, self-sufficient technical development, frequently deprived of the humanistic principle.

[Question] It is said that the artist thinks in images, and the scientist in concepts. How important are the two methods of depicting the world in the mind of man for being able to see into the future.

[Answer] This is itself a hypothetical division. No such division is felt in the minds of great scholars or the hearts of the great artists. I believe that the writer is sometimes bolder and more independant in his thoughts on the future than the scientists, however, whose mental discipline is frequently subordinated to his present knowledge.

They usually cite the textbook example of Jules Verne. Personally, however, I find his forecasts less interesting than those of the subsequent generation of writers, precisely because his was purely technological forecasting. The "golden age" of scientific forecasting for me is linked with the names of H. Wells, K. Capek, and A. Tolstoy, who were among the top dozen writers of his time. These were authors whose works of science fiction can truly be called social forecasting. This is precisely that which interests the important artists. Take Ch. Aytmatov's "I dol'she veka dlitsya den" [And Longer Than the Century Lasts a Day]. The elements of the fantastic here are so free of technological subtleties that they sometimes appear naive. The author was not interested in such details, however, but in the human social consequences of the scientific and technological achievements of our century.

Social investigation also predominates over technological forecasting and in "Giperboloid inzhenera Garina" [Engineer Garin's Hyperboloid]. But then A. Tolstoy was an engineer by education. Furthermore, his scientific consultant was academician P. Lazarev. He explained that is should be a paraboloid. A. Tolstoy answered that a hyperboloid sounds more terrible. This was more important to him than the realities of a device which we would today call a chemical laser. It was a matter of a prediction by a type of technocratic fascist in science, of that same Teller whom he saw with his own eyes decades later.

And then we have Capek with his "R.U.R.," "Krakatit" and "The Manufacture of the Absolute!". Although the term "robot" (from the common Slavic "robota" [work]) thought up by the writer did enter the technical vocabulary, he was also primarily interested in the social consequences of scientific discoveries and technical inventions.

[Question] Numerous Chimeras, rumors and fears of all kinds are sprouting out of scientific soil today. Are these not on the conscience of serious scientists who avoid assessing them in a well-reasoned manner?

[Answer] Yes, we need to answer and not to hush up these naive, sometimes ignorant questions when they come into wide circulation. A group of mathematicians have presently begun revising the historical calendar, as an example, and are actively spreading their viewpoint in the press. They simply discard 5 or 10 centuries without ceremony from the history of man. I asked prominent historians to comment on all of this from the television screen. They replied that it is so unprofessional and absurd they refuse to discuss the questions in detail. But the questions remain!

Incidentally, all of this "mystique surrounding the era of the scientific and technological revolution" results from a loss of perspective in certain people, from extreme pragmatism and from living only for today.

[Question] But does it not also have to do with the consumer attitude toward life? When needs are limited to the endless accumulation of rugs and crystal, man is forced to use substitutes, simplified, semi-mystical explanations for complex phenomena in the spiritual life, where possibilities for both expanding and satisfying his needs are truly unlimited....

[Answer] We are talking about the same thing. Without developing value criteria and ideals to strive for from childhood (consequently, we are talking about an orientation toward the future), we will simply not be able to cope with the petty bourgeois plague of consumption currently threatening mankind.

[Question] I would like to stress something else. We either worship science or accuse it of all sorts of mortal sins. To make gross errors when one writes is uncultured. Everyone knows this. One will hear a well-educated person say that the weather is acting up because we have disturbed space, however. Is there not a new need arising today--the need for CULTURE interrelated with science among the broadest strata of the population?

[Answer] It has already arisen. And it will become increasingly clearly manifested from one year to the next. Our population has a high level of scientific sophistication. The magizine NAUKA I ZHIZN' is published in 3 million copies, and this is a good criterion. We still have numerous reserves, however.

We are not speaking simply of expanding the scope and increasing the skill for popularizing science. As a social individual extending beyond the limits of his specialty, each individual strives for an integrated grasp of reality. He expects this from the modern culture. Therein lies its substance and its significance. This sort of integrated picture cannot be provided without the participation of science, however, a very important element of culture. Man's place in the world and the world inside man himself depend upon a proper understanding of this fact.

11499
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HIGH-PRESSURE PHYSICS INSTITUTE LINKS WITH PRODUCTION DESCRIBED

Moscow LENINSKOYE ZNAMYA in Russian 1 Sep 83 p 2

[Article by Ye. Yakovlev, acting director of the USSR Academy of Sciences Institute of Physics of High Pressures, doctor of physicomathematical sciences, and G. Dubitskiy, secretary of the institute party bureau, candidate of chemical sciences: "The Fate of the Superhard Materials. Results from Science"]

> [Text] In the coming years industry must insure the production of output that in terms of its indicators corresponds to the best up-to-date models, and the introduction of progressive technological processes and on this basis a substantial improvement in labor productivity in the national economy. This is one of the main tasks referred to in the recent CPSU Central Committee and USSR Council of Ministers decree "On Measures To Accelerate Scientific and Technical Progress in the National Economy." Today we publish an article on the problems of introducing the work of the academy institute in practice.

One of the main scientific themes on which the institute is engaged is the study of materials at pressures of 1 million or more atmospheres. In particular, the physicists' attention is being drawn to the fact that at these kinds of high pressures, hydrogen is converted to a metallic state. A gas becomes a metal! Using this very simple material, theoreticians have an opportunity to check the laws of quantum mechanics. It is also of interest for scientists studying the planets.

However, in order to investigate metallic hydrogen it was necessary to solve a number of technical problems. The institute has achieved good results in this direction. Enormous pressure was achieved (more than 2 million atmospheres) and a way was found to measure it, and a method was developed for studying the conversion of dielectrics and insulators into metals and the superconducting properties of the materials formed when this occurs. And if we take into account the fact that the gigantic pressures are developed in a very small volume--one millionth part of a cubic millimeter--then can imagine the kind of difficulties that had to be overcome.

The successes in the field of high pressures studies have become possible thanks to work on the synthesis of artificial diamonds, cubic boron nitride--

niborit--and other superhard materials. The carbonado-type synthetic diamonds that we made and the thousands of crystals used in experiments finally enabled us to achieve pressures of millions [of atmospheres] for the first time in the world.

Our institute started its close cooperation with industry soon after it was set up, particularly following the synthesis of diamonds in 1960. Thanks to the institute's efforts, the production of artifical diamonds and superhard materials started to be developed in the country. Following the synthesis of diamond powders an original method was developed for making large polycrystalline diamonds and thus the problem of obtaining a single-crystal cutting instrument was solved. Now, for example, synthetic diamond cutters of the carbonado type developed at our institute each year machine millions of pistons for internal combustion engines for vehicles.

Our scientists and specialists developed a series of chambers for diamond synthesis. Of course, the designers at the sector institutes and enterprises have improved and updated them, but we laid the foundations for this. And these chambers are now used at all the country's diamond enterprises.

The institute was the first in the world to start cutting hardened steels. When this is done the need for complex, laborious operations such as grinding is eliminated; thousands and thousands of people are engaged in this operation. And so at the same time a social problem is also solved, namely freeing up the work force.

The use of the new superhard materials is particularly timely in view of the expansion of automation. The use of a traditional cutting-alloy tool does not permit the use of automatic lines with sufficient efficiency. In fact, when a cutter is worn out, the entire line must be stopped and the tool changed; and there are many tools and stoppages are frequent. And the more durable the tool the more productive the line and the longer it can be made, which in the final analysis also leads to the complete automation of production. Together with the Kiev Scientific Research Institute of Superhard Materials and the Moscow VNIIalmaz [expansion unknown--ed] and VNIIinstrument [expansion unknown--ed], our institute is intensifying work to develop an instrument made from superhard, wear-resistance materials. And this will provide a colossal national economic effect.

The series production of output made from carbonado and other superhard materials that we developed here has been started up at the Tomilino diamond tool plant. Synthetic diamonds are replacing the more expensive natural diamonds, which are in short supply. Cooperation with the people at Tomilino is effected primarily through the VNIIalmaz. But we have also established direct links with enterprises in and around Moscow.

The specialists at our institute were the first in the world to propose a technology for resawing granite using polycrystalline diamonds. The speed of the process has been increased by a factor of five to eight! Experimental work was conducted jointly with the Moscow stone working combine (Dolgoprudnyy city), the Mytishchi art casting plant and the RSFSR Minstry of the Construction

Materials Industry laboratory of decorative stone. One particularly solid achievement has been the use of the strip resawing method.

We have concluded contracts for creative cooperation with the Podolsk mechanical plant imeni Kalinin, the Podolsk experimental geological prospecting equipment plant, the Klimovsk machine building plant imeni Doyenin and other enterprises.

Several scientific-practical conferences have been held jointly with the coordinating council for accelerating scientific and technical progress and strengthening links between science and production under the Podolsk party gorkom and the Podolsk city council of the All-Union Society of Inventors and Rationalizers. Their authority has grown so much that they now started to be held at an all-union level. Schools of leading experience are also periodically organized.

These kinds of direct links with enterprises are of great mutual significance. They help producers to familiarize themselves with the latest innovations and overcome the psychological barrier that almost always stands in the way of anything new. They help the scientists to check their developments more accurately directly under plant conditions (the test section is, after all, a test section and not all production features can be checked there), and to perceive the specific needs of practice, sectors and even individual enterprises.

At first glance, for an academic institution we have quite good links with production. Nevertheless, we are not satisfied with them. At the CPSU Central Committee June Plenum comrade Yu.V. Andropov talked about the still poor introduction of the achievements of science and technology in practice and what must be done to correct this. He stressed that unified scientific and techncial policy is now acquiring decisive significance. One important task on the agenda is obtaining materials with prespecified properties. This instruction directly affects our institute. Unfortunately, however, too much time elapses between the development of a promising new material in our laboratories and its extensive introduction. Let us cite a few examples.

It would appear that carbonado is used quite extensively within the country. But that is only a general picture. If we investigate the sectors and the technological processes, there are more than adequate reserves for extending its use. Specialists from the Japanese Mitsubishi firm recently conducted the following experiment. They tested drawing devices used to draw galvanized steel wire for resistance to wear; the devices had been developed from materials from our institute and from the U.S. firm General Electric. The American tools withstood a drawing force of 250 kilograms per wire, while ours can withstand 800 and even 1,300 kilograms. Someone referring to the indicators for the Soviet tools wrote the word "fine" in English, followed by an exclamation mark. It is not too often that foreign specialists are so generous in their praise of Soviet products. Well, what of it? Up to now the wire tool made from synthetic diamonds has found no kind of practical application at our metallurgical enterprises.

About 10 years ago we made almet--a diamond and metal composite--at the institute; it does not require tungsten, in short supply, for its synthesis

for instead use is made of diamond waste (literally the dust only microns in size), nor expensive hard-alloy chambers--steel is good enough. The production of almet is ten times cheaper than synthetic diamonds. It is very efficient for machining nonferrous metals and glass-reinforced plastic. Although almet has now been successfully used for many years at a number of enterprises in the country it extensive, centralized production has not yet been set up.

Is a similar fate in store for the strip devices for cutting stone, which, depsite successful tests at enterprises (as mentioned above) has still been put into use nowhere? And likewise the superhard material niborit? Like almet, niborit is made from powder at relatively low pressures in steel chambers. And so its production is also relatively cheap. And it possesses a number of indisputable advantages, of which, perhaps, the main one is its broad range of applications in machining metals of various hardness. A tool made from niborit is significantly superior to the wear-resistant hard alloys when machining moderately hardened steels and cast iron.

What are the reasons for the slow introduction of scientific developments? Evidently they are not new and to some extent are quite typical of all academic institutions. There was serious discussion of this, incidentally, at a recent out-of-town meeting of the USSR Academy of Sciences commission on scientific and technical cooperation with the Moscow oblast organizations, which took place at our institute. As is known, the basic institutes are engaged in introduction primarily through the sector institutes. And despite the fact that we work side by side with the sector people, the process of bringing our completed scientific developments into production realization is going more slowly that life demands. We, of course, realize that they have a plan of their own to fulfill. But the pity is that since they are covered by this plan it is possible to put off for an indeterminate time the introduction of scientific discoveries and inventions by the "theoreticians" that are of exceptional importance for the national economy. This often happens only because the sector people do not see priority for themselves in this joint work. And there is no time to bring "foreign" ideas and proposals into production. And it is here that the chain "idea--project--production" is broken.

As we have already noted, we do have direct contacts with enterprises and we offer them scientific and technical information and finished tools and technologies. But the opportunities of an academic institution really are limited. We can, for example, give this same Podolsk mechanical plant imeni Kalinin 5 or 10 cutters made from a new material. But for such a giant of a machine building plant this is only a drop in the ocean. It needs thousands. And in order to fulfill this wish it is necessary to divert people from scientific experiments.

Sometimes it is possible to produce large numbers of samples of new materials in order to accelerate introduction. But then the institute incurs certain costs. In some cases it is possible to recoup them, but it is difficult to do this even on a purely organizational level. And the help of the economists is needed in solving the problem of accelerating introduction.

The pity is that a contract on creative cooperation with an enterprise is not binding. It is rather a gentlemen's agreement which is maintained by the enthusiasm of individual people rather than some legal enactment. It is not even considered in the plant plan for new equipment. Insufficient attention is given to financial-economic relationships. The institute is the first to suffer here, and ultimately production itself.

Our institute also concludes economic contracts with enterprises. But this form of link is probably more suitable for the sector institute. The enthusiasm for it may interfere with basic research.

At the commission meeting much was said about proposals to make economic levers more well-thought-out so that they really do stimulate the use of scientific and technical achievements in production. In particular, it would evidently be expedient to permit scientific associates to work at the plant on a combined-profession basis during the period in which their proposals are being introduced, provide better credit for the most hopeful research promising significant practical returns, and consider the scales of introduction more precisely. The present incentive system does not always reflect the institutes' real contribution.

It must be recognized that the scientists themselves are also sometimes unaware of the economic possibilities of mutual relations between a scientific establishment and an enterprise. In order to fill this gap, on the initiative of the party bureau an economics seminar is conducted here at the institute, where these problems are discussed.

Yes, each scientist is obliged to strive for the practical embodiment of his ideas and to achieve a national economic effect from his own expensive research work. And what the CPSU Central Committee June Plenum demands is the elimination of certain financial-economic and organizational barriers on this path and the more flexible use of material incentive to help in improving the utilization of scientific developments.

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NEW BOOK TREATS ROLE OF ADMINISTRATION IN SCIENTIFIC AND TECHNICAL PROGRESS

Moscow UPRAVLENIYE I NAUCHNO-TEKHNICHESKIY PROGRESS in Russian 1983 (signed to press 9 Jun 83) pp 2-4, 224

/Title page, annotation, foreword, and table of contents from book "Administration and Scientific and Technical Progress", by Vadim Aleksandrovich Trapeznikov, USSR Academy of Sciences (Series: "Science and Technical Progress"), Izdatel'stvo "Nauka", 19,500 copies, 224 pages/

/Text/ This book contains articles and the texts of reports published by the author over the course of the last 20 years and combined under the general topic: "Administration and Scientific and Technical Progress." The following questions are examined: administration as the source of progress, the strategy of administration, automation as a basic form of scientific and technical progress directly connected with administration, etc.

Academician V. A. Trapeznikov is the director of the Institute for Problems of Administration, a collegium member of the State Committee for Science and Technology of the USSR Council of Ministers (from 1965 through 1978 he was first deputy chairman of the Committee), as well as the author of many scientific works and publications dealing with questions of administration and scientific and technical progress.

Foreword

The book being presented herewith to the reader consists of scientific articles, reports delivered at international congresses and All-Union conferences, as well as speeches by the author printed in the mass press. They encompass a period of more than 20 years and develop one and the same topic: "Administration and Scientific and Technical Progress." All these materials supplement each other, and, on the whole, although they do not exhaust the problem (indeed, how could it be exhausted?!), they do furnish, it seems to me, an idea of the basic elements of this problem and about ways of solving the tasks stemming from it.*

*Summing up in a single book materials published at various times and intended for various audiences has caused a repetition of some "subjects." The articles are printed with minor abridgements and without observing the chronological order.

The book examines engineering problems of automatic and non-automatic controls, as well as questions of an economic nature, for technology and economics are inseparable, especially in the field of administration.

The book sets forth methods for a quantitative evaluation of scientific and technical progress, allowing us to determine the effectiveness of science and to analyze from an economic point of view the results of certain scientific and technical measures.

It cites data on the development of the national economy over a 30-year period. From 1950 through 1980 national income and labor productivity continuously increased. During this time the national income grew approximately 9-fold, while labor productivity increased approximately 6-fold, at average annual growth rates of about 8 and 6.5 percent respectively. It is natural that during various periods in the life of our country the growth rates were different; however, their average magnitudes were extremely significant. Over the elapsed period the country's scientific and technical potential grew immeasurably.

Over the extent of the past 20 years, to which most of the book's materials pertain, diverse questions have arisen, connected with automatic and non-automatic controls. Some of them have been solved, while some remain unsolved or not completely solved. These include, in the first place, the criteria for evaluating the activities of enterprises. Thus, in the article entitled "The Criterion is Quality" (PRAVDA, 1963) I pointed out the consequences brought about by undervaluing product quality and evaluating plan fulfillment only with regard to quantity (in tons) without taking into account the effectiveness of each ton. In the report "Man within the System of Administration" (1971) mention is made of the harm caused by the contradictory nature of such indicators, for example, as quality and quantity. These questions and a number of others examined in the book have not lost their timeliness; they continue to be discussed in the press. And if some of them were not solved during the elapsed lengthy period, even though the solutions were clear already during that time long ago, we must think again of how weighty those causes are which are hampering the overcoming of these shortcomings, about how to solve these problems, in particular, one of the cardinal ones--increasing product quality.

This book consists of three parts. The first part provides the fundamental scientific positions linking up labor productivity, the cost of producer goods (machine tools and machinery), improvements (in the quality) of these goods (U_s), and improvement in administration (U_u). Growth rate of the magnitude $U = U_s \cdot U_y$ determines the rate of scientific and technical progress. And this section sets forth ideas about the informational nature of labor, about the connection between the growth rate in the standard of living and the rate of scientific and technical progress, about the influence of administration on scientific and technical progress, and the like.

The second part is devoted to general questions of the strategy of administration; it examines the role of the human being within administrative systems, and the role played by incentives determining his behavior.

The third part elucidates the problems of automation, which is the leading form of scientific and technical progress, directly linked with administration.

It seems to us that the development of one of the fundamental questions of science and technology--that of administration and scientific and technical progress, as examined over the extent of a lengthy segment of time, constitutes a matter of interest and importance.

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ZHUGANOV SPEECH ON INVOLVEMENT OF KOMSOMOL MEMBERS IN SCIENTIFIC PROGRESS

Riga SOVETSKAYA MOLODEZH' in Russian 12 Nov 83 pp 1,3

[Unattributed report: "The Tasks of Councils of Young Scientists and Specialists in Recruiting Youth To Participate in Fulfillment of Goal-Oriented, Comprehensive and Most Important Scientific and Technical Programs. A Report by Komsomol Central Committee Secretary A.V. Zhuganov"; date and place not specified]

[Text] During the years of the 11th Five-Year Plan much has been done to introduce the achievements of science and technology into production. Since the start of the five-year plan more than 9,200 new kinds of industrial output have been mastered and started up, including about 900 machines of the very important type, and equipment and materials in accordance with the targets of the scientific and technical programs.

At the same time the rates of scientific and technical progress still do not fully meet present-day demands and the task set by the party of combining in deeds the advantages of the socialist system and the achievements of the scientific and technical revolution.

These questions acquire special urgency in light of the recently adopted CPSU Central Committee and USSR Council of Ministers decree "On Measures To Accelerate Scientific and Technical Progress in the National Economy." It is noted in this decree that one very important task for party, soviet, economic, trade union and Komsomol organs is the radical improvement of all activity to accelerate the development of Soviet science and technology and every possible use of their achievements in the national economy.

The main highways of scientific and technical progress are today linked with the fulfillment of 170 comprehensive scientific and technical programs drawn up by Gosplan, the State Committee for Science and Technology and the USSR Academy of Sciences. The programs are a new form for managing scientific and technical progress. They are making it possible to focus and direct the efforts of scientists, designers and producers on the development and rapid practical introduction of new and advanced equipment and technology insuring a sharp rise in the level of production mechanization and automation and improved labor productivity.

Questions of improving the work of the Komsomol committees and the councils of young scientists and specialists on participation in the acceleration of technical progress were comprehensively reviewed at the 19th Komsomol Congress and subsequent plenums of the Komsomol Central Committee, and they are periodically discussed at meetings of the Komsomol Central Committee bureau and secretariat. In order to improve the information available to the Komsomol committees, together with the State Committee for Science and Technology the aktiv of the Komsomol Central Committee has sent lists of the stages and tasks of the programs being implemented in given regions to the union republic Komsomol Central Committees and the Komsomol kraykoms and obkoms.

On the basis of a study and generalization of experience gained at the local level, recommendations on recruiting Komsomol members and young people for fulfillment of the comprehensive, goal-oriented and most important scientific and technical programs have been drawn up and circulated. All directions of work by young scientists and specialists are being increasingly subordinated to this task. Thus, developments effected within the framework of the programs are assigned preference when results are summed up in the competition for the Leninist Komsomol prizes in the field of science and technology. Each year 10 or 12 all-union schools are organized on this range of topics. Seminar-conferences are held for the chairmen of the councils of young scientists and specialists in the leading sectors of the national economy.

The organizational activity of the Kiev Komsomol gorkom in mobilizing youth for the acceleration of scientific and technical progress and the completion of goal-oriented programs was considered at a meeting of the Komsomol Central Committee Bureau. The basis of activity by the Komsomol committees in the this city is the program "The Youth of Kiev for Progress in Science, Technology and Production." Similar programs have been drawn up in all raykoms and the 260 primary Komsomol organizations directly involved in this work.

The diverse forms for recruiting youth for realization of the goal-oriented, comprehensive scientific and technical programs are being skillfully used by the Komsomol committees in Belorussia, Georgia, the Ukraine, and Gorkiy, Ivanovo, Novosibirsk, Sverdlovsk and a number of other oblasts.

More than 200 Komsomol organizations at the industrial enterprises and scientific establishments in Leningrad city are taking part in the implementation of all-union, sector and territorial programs. The main attention is being given to the planned introduction of the achievements of science and technology, mechanization and automation, and the reconstruction and retooling of production. Together with other intensification factors this has made it possible since the start of the five-year plan to insure an increase in output of almost R1 billion through labor productivity growth alone.

Interesting experience in work to insure the active participation of youth in fulfillment of goal-oriented scientific and technical programs has been gained by the Lvov Oblast Komsomol organization. Seven interdepartmental scientific-technical complexes that unite 144 enterprises, scientific research institutes, design bureaus and VUZ's are now functioning there. In each complex the oblast Komsomol committee and the Ukrainian SSR Academy of Sciences West

Scientific Center have set up coordinating councils for young scientists and specialists and interdepartmental public creative associations, and a program has been confirmed for Komsomol and youth patronage over small-scale mechanization and the development of automated manipulators and scientific instrument building.

Jointly with the republic councils of the Scientific and Technical Society and the All-Union Society of Inventors and Rationalizers, the Latvian Komsomol Central Committee has prepared a set of methodological recommendations entitled "Youth and the State Scientific and Technical Programs." It contains sections both of a theoretical nature, explaining the aim of the programs and their place within the system of improvements in the management of the national economy, and also specific instructions on the forms and methods of work for all levels of Komsomol organizations and councils of young scientists and specialists in the republic. A resolution has been drawn up on republic youth scientific and technical programs. A coordinating council has been set up to guide the course of work, and the enterprises and organizations participating in the fulfillment of tasks and the time periods for introduction and specific forms of youth participation have been established. Annual accountability to the Latvian Komsomol Central Committee has been established for Komsomol committees and the councils of young scientists and specialists for the course of fulfillment of programs. A resolution has been confirmed on competition for economically effective and technically advanced work, and socialist competition has been organized for the comprehensive creative youth collectives [KTMK] and the Komsomol-youth collectives of scientific and engineering-technical workers.

A.V. Zhuganov went on to say that the councils of young scientists and specialists have an important role to play in recruiting youth for the fulfillment of the scientific and technical programs. The Komsomol Central Committee Counil of Young Scientists and Specialists is carrying out this work with great responsibility and initiative. Within the framework of its commissions, patronage has been established for a whole range of very important problems, including the development of laser technology for the national economy, transportation systems based on new technological bases, the development of methods for increasing oil recovery, the comprehensive processing of Kansko-Achinsk coals and a number of others.

The commission for assistance in the development of nuclear power engineering coordinates the activities of more than 160 Komsomol organizations in implementing the goal-oriented program "Slow and Fast Nuclear Reactors." The range of the patronage headquarters covers both fundamental scientific research and the development of technological and planning documentation, the manufacture of equipment, questions concerning the startup and operation of nuclear power stations, and the professional growth of young specialists. The commission's work experience shows that patronage for goal-oriented scientific and technical programs should be effected by the Komsomol committees and the councils of young scientists and specialists simultaneously at all levels: in the primary, rayon, city, oblast and republic organizations.

Not all Komsomol committees, however, have specified the particular forms of their own participation in the realization of the scientific and technical

programs. This applies first and foremost to the Komsomol organizations of Kazakhstan, Kirghizia, Turkmenia, Estonia and Maritime Kray.

The sector councils of young scientists and specialists are called upon to play a major role in recruiting youth for the implementation of scientific and technical programs. The councils of the Ministry of the Radio Industry, the Ministry of Machine Building, the Ministry of the Electrical Equipment Industry, the Ministry of the Coal Industry and a number of others have already started this work.

Joint activity by the Komsomol organizations at institutes and enterprises in different sectors working on a single task has helped in the ahead-of-schedule handover of of the Urengoy-Pomary-Uzhgorod transcontinental export gas pipeline.

The sector councils of young scientists and specialists must move as active organizers of youth patronage for the fulfilmment of goal-oriented comprehensive scientific and technical programs. It is precisely they that are able to inform the Komsomol executor organizations in good time about the tasks and stages of the programs, help in concluding the agreement on creative cooperation, and constantly monitor material-technical support for work in hand. In short, they can help in establishing precise relationships along the entire chain of research and development, from the idea to its practical realization.

Comrades. As a rule, a considerable number of organizations participate in the implementation of the scientific and technical programs. They include head scientific establishments, which must on a mandatory basis coordinate the activities of the rest, and they are allocated appropriate rights and material and financial resources and so forth. Special attention should therefore be directed to work with the Komsomol organizations and councils of young scientists and specialists at the head institutes and attempts made to achieve every possible enhancement of their organizing role.

The comprehensive creative youth collectives have recommended themselves well as an efficient form for recruiting youth for solving urgent scientific and technical problems and accelerating the introduction of developments in production, and this is particualrly important within the framework of implementing the goal-oriented programs. More than 15,000 KTMK's are now operating successfully in the country, made up of about 120,000 young scientists, engineers, workers and students.

It is not only the economic but also the educational effect of KTMK activity that is important. In these kinds of collectives the real specialist, skillful organizer and innovator is formed, capable of successfully mastering leading experience, progressive technology and new equipment, and able to deepen the integration of science and production and strengthen the union of thought and labor.

However, many Komsomol committees and councils of young scientists and specialsists are not yet making full use of this form of work, and economic leaders sometimes underestimate the economic, scientific and, especially,

educational importance of the KTMK and do not always support the initiative of youth. The experience of the best KTMK's must be propagandized and generalized more extensively amd attempts must be made to set them up at the most important sectors of the scientific and technical quest, and first and foremost in the implementation of the goal-oriented programs.

Nor should the other creative youth associations be forgotten: the public patent, design and information bureaus, the introduction brigades and so forth.

The Komsomol committees must work persistently to recruit young scientists and specialists at the academic and sector scientific research institutes, industrial enterprises, VUZ's and branches of the All-Union Society of Inventors and Rationalizers and the Scientific and Technical Society more broadly in solving the tasks of accelerating the use of the achievements of science in production. The Komsol organizations of the scientific research institutes, VUZ's and enterprises in Dnepropetrovsk Oblast have concluded more than 400 agreements on scientific and technical cooperation. This form of work has been disseminated extensively in the Komsomol organizations of Georgia, Latvia, Siberia, the Urals, Leningrad and Moscow city and oblast.

Socialist competition, A.V. Zhuganov went on to say, is a powerful means of mobilizing youth. Contests for the title "Best Young Scientist (or Specialist)" have been extensively organized in the Komsomol organizations of Saratov, Tula, Tyumen, Kharkov, Chelyabinsk, Volgograd and Kuybyshev; the working categories include scientific associate, designer, technologist, foreman, technician and laboratory technician. They are making it possible to recruit a wide range of young people with various specialties for the competition.

It is the duty of Komsomol committees and councils of young scientists and specialists to improve the practical direction of socialist competition and its focus on obtaining high final results. As comrade Yu.V. Andropov stressed in his speech at the CPSU Central Committee June (1983) Plenum, the main attention should be focused "... on competition aims such as improving output quality and improving the use of production capacities, raw materials, energy and work time. And, of course, sensible thrift, savings of everything, from the ton of metal to the kilogram of grain."

Intensifying the regime of thrift is the most accssible and most economic way of increasing production efficiency for any collective. It is important not only with regard to those participating directly in production, but also to those who develop new technology and machines; even at the stage when technical documentation is being prepared it is possible to save enormous amounts of metal, raw materials and energy resources.

Success in the work depends largely on clearly established control over all stages in the implementation of scientific and technical programs and the status of executive discipline. No single question capable of improving the position in these directions should remain outside the field of view of the Komsomol organizations.

Crucial tasks face young scientists and specialists in implementation of the USSR Food Program, which is underpinned by 20 scientific and technical programs. The party and government are doing much to provide skilled cadres for the countryside. It is important henceforth to enhance the role and authority of the councils of young scientists and specialists in the rural raykoms and the kolkhozes and sovkhozes and to increase their contribution in solving problems in agricultural production.

In the Ukraine, Kuban, Moldavia and Maritime Kray patronage by young scientists and specialists at scientific research institutes engaged in agricultural disciplines over the Komsomol-youth collectives in the agrarian-industrial complex is being developed on the basis of agreements between the young scientists at the scientific research institutes and the youth collectives at the kolkhozes and sovkhozes.

The upsurge in agriculture is a nationwide matter. Accordingly, in the implementation of the Food Program young scientists and specialists and technicians and workers at machine building enterprises who are not directly associated with agriculture, should make their contribution. They can and must provide much help in the design and development of agricultural equipment. For example, many of the unresolved questions in the work of the Komsomol committees in recruiting youth for improvements in agricultural power engineering are of decisive significance for improving agriculture's efficiency and stability.

On the scientific and practical planes the solution to power engineering problems still does not meet the requirements of agricultural production. The quality of machines developed by the enterprises of the Ministry of Tractor and Agricultural Machine Building is still very poor. Six types of assemblies developed in 1982 failed to pass state testing because of inadequate reliability. The All-Union Scientific Research Institute of Mechanization of Agriculture is one of the head organizations for work on and the development of these machines and mechanisms. But how is it possible to talk about youth participation in implementation of goal-oriented comprehensive scientific and technical programs when in the Komsomol committee and the council of young scientists and specialists they do not know the precise lists for the programs in which the institute is participating? And up to now they have given no thought to Komsomol patronage over this important matter.

The Komsomol committees and councils of young scientists and specialists must precisely establish their place in improving the efficiency of agricultural production and in improving and updating the work of all links and sectors of the agrarian-industrial complex in patronage over the development of new and highly productive agricultural machines, the introduction of scientifically substantiated systems of farming, plant selection and animal breeding, and expansion of the range and improvements in the quality of products in the food and meat and dairy industries.

Comrades. The intensification of social production outlined by the 26th CPSU Congress has brought to the forefront the need for the comprehensive mechanization and automation of production on the basis of the extensive application of computers and robots and the introduction of flexible technologies making it possible to switch production rapidly and effectively to the manufacture of a new product.

The tasks of recruiting Komsomol members and young people to solve these problems are defined in the Komsomol Central Committee resolution "On the Participation of Komsomol Organizations in the Development and Introduction of Program-Controlled Automated Manipulators in the National Economy." Analysis of the course of its fulfillment shows that the Komsomol committees and councils of young scientists and specialists have set to on this work with great interest. However, the participation of the Komsomol organizations in solving this problem should be more effective and active.

The problem of developing flexible automated production facilities--the prototypes of the enterprises of the future--also requires the creative efforts of young scientists and specialists.

Another problem just as important is that of automating planning and design work and scientific research. This not only substantially improves the labor productivity of scientists and designers but also insures a high technical level in the machines, instruments and equipment developed, and has a major national economic effect. Young scientists and specialists have not yet said their last weighty word in this field.

Production retooling on the basis of the achievements of science and technology and fitting out production with the latest equipment make up only one side of the coin. Numerous examples could be cited of the inefficient use of the latest machines and equipment. Take, for example, robots or computer technology. The statistics show that the computer inventory is being used only 9 hours a day.

During the course of work to implement the programs the Komsomol committees and councils of young scientists and specialists should not lose sight of the problem of the efficient use of everything that is developed through the efforts of scientists, specialists and workers. In particular it is essential to organize the broadest study by young people of methods for working with computers and algorithm problems, intensify lecture propaganda on questions of the development and use of computers in the national economy, and improve work among schoolchildren in mastering the bases of work with computer equipment.

Because of the further rapid development of computers it is expedient for the Komsomol Central Committee Council of Young Scientists and Specialists to draw up a program to recruit all youth groups to master the habits of work with computers and to improve efficiency in their use.

Comrades. The CPSU Central Committee June Plenum stressed that one of the most important integral parts of the building of communism is ideological and mass-political work, A.V. Zhuganov went on to say. In light of the plenum instructions the recruitment of youth for participation in the acceleration of scientific and technical progress and the implementation of the comprehensive scientific and technical programs should be regarded as a most important socioeconomic condition for enhancing the effectiveness of educational work with young scientists and specialists.

Participation in implementation of the programs should promote the formation in each young person of a sense of belonging in the nationwide struggle to solve cardinal national economic problems and a recognition of his personal responsibility for the economic development and increased defensive might of the Soviet state.

The system of Komsomol political training and economic education faces major tasks. It is important that the councils of young scientists and specialists and the Komsomol committees focus their efforts on developing and instilling in young men and women the requirement of constant independent work to raise their own ideological and theoretical levels and to persistently seek out the most effective forms for organizing this work.

There should be a constant striving to strengthen the links between the theoretical seminars, conferences and lectures and the practical activities of young scientists and specialists.

Special attention should be given to various forms of economic education. Acquiring deep economic knowledge must be subordinated exclusively to the requirements of the intensification of the national economy and the development of contemporary economic thinking and socialist enterprise and efficiency.

The practice of using seminars to study and disseminate the best experience and advanced forms and methods of work, and to help those attending to make socialist pledges economically substantiated and to consider and realize their proposals aimed at improving labor organization and making more complete use of the results of production, deserves every possible support.

In organizing work to recruit youth for the acceleration of scientific and technical progress it is necessary to proceed from the premise that only a clear idea of the final results of one's own labor and its link with the activities of the labor collective and society in general can generate true labor enthusiasm in a person. And accordingly, the broad recruitment of the young scientific and technical intelligentsia for agitation and lecture-propaganda activities and the spread among it and among other youth groups and all workers of the aims and tasks in the economic strategy and policy of the CPSU and Soviet government, and a knowledge of the latest achievements of science and technology is an important task for the councils of young scientists and specialists.

The editorial offices of the mass information and propaganda media for youth, primarily the republic and oblast youth newspapers, should involve themselves more specifically with questions of youth participation in the acceleration of scientific and technical progress. Today, you see, only ZNAMYA YUNOSTI (Belorussia), MOLODEZH' GRUZII, SOVETSKAYA MOLODEZH' (Latvia), NOORTE HAAL (Estonia), NA SMENY (Sverdlovsk), MOLODOY KOMMUNAR (Tula) and some others regularly raise the problems of recruiting youth for the acceleration of scientific and technical progress.

Comrades. It is stressed in the CPSU Central Committee and USSR Council of Ministers decree "On Measures To Accelerate Scientific and Technical Progress

in the National Economy" that the practice of employing program, goal-oriented planning for the development of science and technology will also be further extended in the future: "Starting with the 12th Five-Year Plan all-union, republic (or interrepublic) and sector (or intersector) scientific and technical programs, and also scientific and technical programs for regions and territorial-production complexes will be drawn up..." Such are the immediate prospects for the programmed development of scientific and technical progress. This will set new long-term and crucial tasks for the Komsomol organizations and the councils of young scientists and specialists.

The Komsomol Central Committee expresses its firm conviction that Komsomol members, young scientists and engineering and technical workers and all youth in general, fully and completely approving and supporting our party's Leninist domestic and foreign policy, will augment their efforts in the struggle to accelerate scientific and technical progress and make a worthy contribution to the further flourishing of our great motherland.

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INSTITUTE OF HIGH-FREQUENCY CURRENTS BRANCHES OUT INTO NEW FIELDS

Moscow LENINGRADSKAYA PRAVDA in Russian 23 Nov 83 p 2

[Article by Ya. Strugach: "Principal Transformation"]

[Text] Standing alone among the trees of Shuvalov Park is an ancient building that has been repeatedly remodeled at various times. In it are seclusion, concentration, meticulous care in research. Of course, the city noise cannot be heard. This building houses the All-Union Scientific Research, Design, Planning and Technological Institute of High-Frequency Currents imeni V. P. Vologdin.

"But the very least of our work is with high-frequency currents" acknowledge the engineers.

Then just what is it that they do? What is the purpose of the complicated instruments and facilities, the experimental shop and the experimental plant? What occupies several hundred engineers in one of the leading institutes of the sector?

The institute has never lacked for clients. Tempering parts with high-frequency currents? Nothing to it. Welding? All kinds of facilities have been developed and installed in enterprises. Melting various materials? Also well known and developed.

In the thermal shops of various enterprises I have seen high-frequency generators and furnaces in which all kinds of parts are brought rapidly to white heat; there was no noise of burning jets, nothing resembling the forges of bygone days -- and it was like a miracle. But the shop workers grabbed the fiery metal with tongs and carried it to the quenching vats, and this was heavy manual labor that was seemingly off limits to scientific research.

Work is now in progress in the experimental shop of the institute on getting equipment for heat-treating twenty-kilogram steel rings ready for shipment to the customer. Still the same high-frequency generator, the inductors that set up the electric field to heat the parts, the quenching vat. And nearby -- a robot.

It could have been left out. The client could have been given only "his own" equipment, or special mechanisms could have been developed for conveying parts. Nevertheless, the robot was included.

This is not just a tribute to a fad. At a conference where the technical proposal was being discussed and no particular problems had come up, all at once a suggestion was made of a robotized complex. Objections rang out: "What for? To complicate something that is clear?" "No, not to complicate it" said the others, "but to simplify it."

This was not at all an argument about technical subtleties. It was an argument about the essential point of the matter, about the near future, about the responsibility of collectives who have developed new equipment, about the position of those who are called engineers.

The director of the institute, Feliks Vasil'yevich Bezmenov, insisted on a robotized complex. In the final analysis, such a decision brought with it a direct advantage. The designers took a robot that had already been produced in the sector, incorporated it into the plan, and eliminated the necessity of developing a fairly complicated conveyer and turning out several pages of technical documentation. The robot was set up in the experimental shop, the control unit was programmed, and there was no need for the prolonged and labor-intensive work that is involved in making any mechanisms. The plant that is commissioned with series production of the complex equipment is also freed of a considerable part of the machining and assembly work. Finally, the client is given the capability of handling other parts as well, without special modification of the equipment.

What seems to be an isolated fact at first glance, filling an order, turns out to be an important event in the life of the entire institute and of specialists who had been working heretofore in a rather limited area of science and engineering. Today, progressive technology in the shop has been combined with modern facilities of production automation. And the engineers should be given their due: this was an event they had been trained for.

It is no accident that the socialist commitments of Leningrad workers in this field contains a point that is the responsibility of the institute collective: to provide a high-frequency facility for bending pipes. This work is close to completion, and will culminate with production of a unique mechanized complex.

Not far from the robotized complex, equipment for heat-treating crankshafts for the Likhachev Plant [ZIL] is being readied for shipment to the customer. Still the same high-frequency generators and inductors that have always been used in cases like this, but now installed in an automated transfer line. Head engineer S. Ye. Semenov actuates the unit, and we have but to observe how the crankshafts go from one inductor to the next in accordance with the commands of the automaton, turning around in the invisible high-frequency field.

"The productivity of the unit?" Department Chief Viktor Gennad'yevich Shevchenko repeats our question. "An average of 80 and maximum of 100 shafts per hour. But the next unit is going to work faster. This, after all, is a prototype. And now it has been decided to use a microprocessor for control, and there will be some innovations in mechanics..."

In one of the laboratories where research is being done on the specifics of the plasma that arises in a high-frequency field, the engineers recently became curious about a property of the plasma and began to study it. The results of the research could have been summed up and conclusions drawn with recommendations to whoever wanted to use the new technology. And this will be done in part; but even now, "Elektrosila" is using similar equipment, there are already some practical results.

At a signal from Division Chief Igor' Petrovich Dashkevich, the high-frequency field is switched on, the gas is admitted, and the bright flame of the plasma is ignited in the chamber. Moments later, I am shown items with a grayish film applied on the edge.

Dashkevich talks about the results of metallographic studies, about the simplicity and advantage of using this technique under production conditions as compared with the old, tells about how the handling of such equipment can be robotized, and once again one involuntarily gets the impression that this is not a specialized scientific organization, but a collective where anything can be done.

Viktoriya Ivanovna Dobrovol'skaya directs the department that is developing equipment for producing various materials. An electrical engineer by education, she has the degree of candidate of technical sciences, and has been working for about twenty years in growing crystals of ruby, sapphire, silicon and germanium. All this is put to use in electronics and laser technology.

Dobrovol'skaya defines her professional interests with engineering precision: "About ten percent of our work here is now high-frequency technology proper. All the rest involves the technology of all kinds of materials and electronics."

And in looking at the equipment in this laboratory, at what has been done in recent years, you suddenly see not only the occasionally remarkable scientific discoveries and breakthroughs, but also how they have been materialized in instruments and machines. For example, how yesterday's intricate procedure for growing silicon crystals literally worth their weight in gold has now been transformed to a routine production process, and the worker who controls this process produces a silicon cylinder little short of a meter in length in a single shift.

But you also see that already today engineers are taking the next step, attempting to make the technology that has been developed not only simple to use, but also easy to control. We know that producing electric energy is just half of the job, it has to be brought into the building and provided with a breaker.

By the same token, in this laboratory, where there is already enough to worry about what with producing newer and newer materials, there is talk about complete automation of the process, about freeing operators who still have to keep constant watch on instruments, about increasing labor productivity of everyone who works with the facilities developed in the institute.

The remarkable technological transformations that are carried out in the laboratories of scientists are always impressive. They become even more impressive when they arrive in production departments, not in test tubes, but in the form of recommendations and principles, in radically changed working conditions for people. This is the path unswervingly chosen by the collective of the All-Union Scientific Research, Design, Planning and Technological Institute of High-Frequency Currents. And for this reason, within the walls of the institute there is yet another major transformation that takes place: every ruble that is expended on research and development is transformed to 8.3 rubles obtained by the national economy of the USSR.

6610
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ALL-UNION CONFERENCE ON CONTROL PROBLEMS HELD IN ARMENIAN CAPITAL

Yerevan KOMMUNIST 16 Nov 83 p 2

[Article from Armenpress: "The Horizons of the Science of Control"]

[Text] Questions of the current condition and the future of the basic directions of control theory and technology remained the main topic on the second day of work of the 9th All-Union Conference on Control Problems, which was held in the capital of the republic.

Academician T.I. Zaslavskaya, chief of the Department of Social Problems at the Institute of Economics and Organization of Industrial Production, Siberian Department, USSR Academy of Sciences, described the results of research conducted jointly by Novosibirsk sociologists and Moscow cyberneticists, the goal of which is substantiation of specific methodological approaches to solving the problem posed by the 26th CPSU Congress for leveling the social distinctions on a territorial plane; that is, between union republics, large regions, cities and settlements:

"The first step in this direction was bringing to light currently existing distinctions in the living conditions of territorial population groups 'from top to bottom', from the republic to the smallest settlements," she said. "Thus, research has already been completed on the living conditions of the rural population of 130 oblasts and krays. As a result, they have been divided in aggregate into eight large zones, and a specific complex of development has been recommended for each. The very same work has been carried out for all rural regions of Western Siberia. It is also being carried out at the settlement level. The results of the work are being considered during development of the general plan for resettlement of the population on the territory of the USSR, in the Comprehensive Program for Scientific and Technical Progress and its Socio-Economic Consequences."

In recent years a new trend in robot technology has been developed--creation of transport robots, which solve transportation problems autonomously. Their operation can be automated to a significant degree, right down to on-board systems with artificial intelligence. Speaking on this trend was the Leningrad scientist, Doctor of Technical Sciences A.L. Kemirdzhian, holder of the Lenin Prize:

"Transport robots," he said, "Can be used in sectors where it is difficult or dangerous for a man to work, where he must be freed from hard or routine activities connected with movement. Such robots could not be better suited for performing special tasks. They can become rescue vehicles, can explore undeveloped regions, can function as vehicles for exploring the planets, etc."

The most practical results achieved in this direction are shop transport robots, which are already undergoing testing in plants in Leningrad and outside Moscow; and there are robot tractors, created by specialists in Moscow and Georgia.

The first transport robot to be created and used for a practical purpose was "Lunokhod-1", the Soviet automatic mobile laboratory, which operated for 11 months on the moon.

New computer systems developed jointly by scientists at the Moscow Institute for Control Problems and specialists at the Severodonetsk "Impul's" Scientific-Industrial Association, are capable of 200 million short and 12 million arithmetical operations per second.

Moscow scientists from the Institute of Control Problems spoke of this at the conference. Replying to a question from an Armenpress correspondent on which methods these principally-new computers were based, Doctor of Technical Sciences, Professor E.A. Trakhtengerts said:

"Two basic principles may be cited for creating such high-speed computer systems. The first is simultaneous execution of many operations in the computing process. For example, with the aid of the PS-3000 computer, one may physically operate several assemblies of one and the same object simultaneously, implementing local control of each assembly separately--which is complicated enough--and at the same time combine them into a single control contour. This could be either an atomic power plant, where the separate components are the reactor, the steam generator, and turbine, or such a complicated object as a rolling mill or a cogging mill.

"The second principle on which creation of high-speed computers is based consists of adaptation of the computer's hardware and software resources to the demands of the computing process itself. In actual fact, each step in the computing process requires varying amounts of computer resources: memory, the arithmetic-logic device, input-output channels and so forth. By virtue of correctly considering and redistributing these resources, a significant increase in the productivity of computer systems can be achieved."

9006
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BRIEFS

NEW UKRAINIAN SCIENTIFIC COUNCIL--KIEV, 23 Nov--In order to further strengthen the party's influence on the conduct of a unified scientific and technical policy in the republic's national economy, as well as to coordinate the work of the party committees along these lines in the light of the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures for Speeding Up Scientific and Technical Progress in the National Economy," a council has been created under the CP of Ukraine Central Committee to facilitate scientific and technical progress. The chairman of this council is member of the Politburo of the CPSU Central Committee and first secretary of the CP of Ukraine Central Committee, V. V. Shcherbitskiy. The first session of the council was held today. /By PRAVDA correspondent M. Odinets/ /Text/ /Moscow PRAVDA in Russian 24 Nov 83 p 2/ 2384

NEW ENGINEERING-PHYSICS INSTITUTE--IZHEVSK, 27 Nov--An engineering-physics institute--Udmurtiya's first research institution of the Uralsk Scientific Center of the USSR Academy of Sciences--has been opened in Izhevsk. The institute's principal purpose is to aid enterprises in working out and introducing new engineering processes. The first practical steps have already been taken: agreements have been concluded with production associations and large plants. A number of instruments have been created for research work. /By PRAVDA special correspondent A. Artamonov/ /Text/ /Moscow PRAVDA 28 Nov 83 p 2/ 2384

CONFERENCE ON STANDARDS--The role played by standards in increasing the effectiveness of scientific research and in speeding up scientific and technical progress constituted the topic of a coordinated conference among the USSR Academy of Sciences and the Union-Republic Academies of Sciences, which was held on 10 November in Kishinev. Taking part in its work were scientists representing about 80 of this country's scientific organizations. The conference participants summed up the results of creating normative-technical documentation on the questions of the development, production, and use of instruments for scientific research and the automation of experiments. A discussion was conducted on the draft of the prospective--until 1990--plan for promulgating standardization in the sector of "Science and Scientific Services." The scientists noted that they must expand their work with regard to creating a normative base for the sector, aimed at speeding up scientific and technical progress, activating the participation of the standardization and metrological services in defining and implementing the technical policy of the academic organizations. In accordance with the conference's program, work was also organized for the all-academic school opened here on the problem of "Standardization and Metrology"; it has been called upon to lay the foundation for a unified system

of views among the representatives of these services. /By ATEM correspondent/ /Text/ /Kishinev SOVETSKAYA MOLDAVIYA 12 Nov 83 p 2/ 2384

COMPUTER-SCIENCE CONFERENCE--A wide circle of questions connected with the new phase in the development of computer technology and data-processing systems were brought up for discussion at the All-Union Scientific and Technical Conference to be opened on 26 September in Ashkhabad on the topic of "Logico-Algebraic Models of Representing Knowledge in Economic, Technical, and Organizational Systems." It is being conducted by the Scientific Council of the USSR Academy of Sciences and the Scientific-Research Economics Institute, together with the Computer Center of TSSR Gosplan. The conference's reports and speeches--and about 50 of them have been prepared--will discuss the scientific and practical problems of utilizing the new generation of computers, along with further improving the systems of administering the national economy. (Turkmeninform) /Text/ /Ashkhabad TURKMENSKAYA ISKRA 2 Sep 83 p 3/ 2384

CONFERENCE ON SUPERCONDUCTIVITY--The status and prospects for the technical use of superconductivity are being discussed by the participants in an All-Union Conference which opened yesterday in Leningrad. Organized by the USSR Academy of Sciences, it has assembled more than 200 scientists and specialists from the leading research centers of the Soviet Union, as well as those of Bulgaria, Czechoslovakia, the FRG, and Switzerland. In speaking at the opening, the chairman of the Presidium of the Leningrad Scientific Center of the USSR Academy of Sciences, Hero of Socialist Labor, Academician I. A. Glebov noted that in recent years superconductivity has found the widest use in the manufacture of cryogenic turbo-generators, electric motors, items of microelectronics, super-strong magnets, and various types of cables. Questions connected with the development and manufacture of systems of a controllable thermonuclear synthesis were elucidated in his report by the director of the Scientific-Research Institute of Electro-Physical Apparatus imeni D. V. Yefremov, corresponding member of the USSR Academy of Sciences, V. A. Glukhikh. Today the conference participants are continuing their work in sections, where they are discussing the prospects for creating new superconductive, electrical-engineering apparatus, magnetic systems, materials, and cryogenic equipment. (LenTASS) /Text/ /Leningrad LENINGRADSKAYA PRAVDA 27 Sep 83 p 1/ 2384

GDR ELECTRONICS EXHIBIT--An exhibit entitled "New Electronic Components from the GDR" was opened at the ESSR Exhibition of National Economic Achievements on 28 September by the National Foreign-Trade Enterprise of the GDR, Elektronik Export-Import. "The introduction of electronic instruments into various spheres of human activity," stated the exhibit director, Yorg Kubsh, in speaking at the opening ceremony, "in considerable measure, frequently a decisive one, has facilitated the working out of extremely complex scientific and technical problems, an increase in the productivity of physical and mental labor, and improvement in the economic indicators of production. Our country's cooperation with the Soviet Union in the field of the electronics industry serves as a powerful stimulus to scientific and technical progress in both socialist countries and is strengthening our economy." A symposium will be

conducted within the framework of the exhibit with the aid of the ESSR Chamber of Trade and Industry. Attending the opening of the exhibit were the department chiefs of the CP of Estonia Central Committee, V. Il'ves and R.-R. Merisalu. (ETA) /Text/ /Tallinn SOVETSKAYA ESTONIYA 29 Sep 83 p 1/ 2384

CONFERENCE ON PHYSICS OF CRYSTALS--Problems of studying a wide sprectrum of the properties of crystals and the technology of growing them comprise the subject-matter of the conference of physicists from the USSR and the GDR which opened on 10 October in Kishinev. It is being conducted within the framework of the program being carried out by the academies of science of the two countries of scientific and technical cooperation in the field of solid-state physics and materials science. The scientists are examining the results of joint projects and experiments, exchanging experiences in their studies of the structural mechanisms of crystals and methods of controlling their properties, and they are discussing prospects for further cooperation. (ATEM) /Text/ /Kishinev SOVETSKAYA MOLDAVIYA 11 Oct 83 p 3/ 2384

NEW RESEARCH INSTITUTES--The Kazakh Academy of Sciences has added three research institutions at the same time. It has absorbed the Institutes of Geography and the Ionosphere in Alma-Ata and the Institute of Organic Synthesis and Coal Chemistry in Karaganda. /Text/ /Minsk SOVETSKAYA BELORUSSIYA 15 Jul 83 p 1/ 2384

SOVIET-SWEDISH SCIENTIFIC, BUSINESS TIES--On 20 October in Kishinev the scientific-practical seminar entitled "New Methods and Developments in Biochemistry, Electronic, and Optical Microscopy by the LKB Firm" completed its work. It had been organized by the USSR State Committee for Science and Technology, the Academies of Sciences of the USSR, the Moldavian SSR, and the Swedish instrument-building firm of LKB. In commenting upon the results of this meeting, the firm's director, Yorg Robert, stated as follows to the ATEM correspondent: "The seminar went successfully. And like the previous, analogous meetings, it provided the specialists with a good opportunity to share their experience and research methods, as well as their technical ideas. The 15-year period of practical business ties between the LKB firm and the Soviet scientific and foreign-trade organizations can be characterized with complete justification as mutually advantageous, constantly expanding, and very useful for us. Their fruitful development has, to a large extent, been facilitated by the Soviet state's foreign-policy course, directed at carrying out universal cooperation and trade with foreign countries. Fidelity to such a course was again affirmed by the recent Declaration made by the general secretary of the CPSU Central Committee and chairman of the Presidium of the USSR Supreme Soviet, Yu. V. Andropov. As regards the calls by the Reagan administration for a freeze on economic contacts with the USSR, the business circles of our country have recognized their absolute groundlessness. These business circles advocate an expansion of Sweden's traditional ties with the Soviet Union," Y. Robert emphasized. /Text/ /Kishinev SOVETSKAYA MOLDAVIYA 21 Oct 83 p 3/ 2384

ITALIAN AGRO-INDUSTRIAL EXHIBIT--The specialized, agricultural exhibit entiled "Agritaliya-83," which opened in Moscow yesterday has become a meeting of business partners. More than 200 Italian firms, associations, and cooperatives are demonstrating their products. There are ten major thematic divisions here,

representing all the parts of the agro-industrial conveyor. In contrast to the first "Agritaliya" exhibit, conducted in our capital two years ago, when the products of the country's agrarian sector were shown with particular breadth, the arrangers of the present show have paid more attention to technology. There is an extensive presentation of machinery and equipment for purely agricultural purposes as well as for processing, preserving, and storing farm produce. Among the participants in the exhibit are also many small and medium-sized firms. It has already become a good tradition during the exhibits in Moscow to arrange useful contacts and establish business ties. We talked about this with Doctor P. Berti, director of the Import-Export Department of the Italian Federation of Agricultural Consortiums ("Federkonsorzzi") --the largest national cooperative organization. He told us that during "Agritaliya-81" the association's products had attracted the attention of the Soviet foreign-trade organizations. The results of this interest were materialized in contracts. The significance of "Agritaliya-83" was talked about in an interview with the Deputy Minister of Agriculture of the Italian Republic, D. Dzurlo, who had come to participate in the ceremony opening the exhibit. "I have had more than one occasion to visit Moscow," he said. "Close trade and economic ties between our country and the Soviet Union were established long ago. By conducting the present exhibit we would like to strengthen and expand them. I think that now, when the USSR is moving forward to implement the Food Program, it is a very suitable time for this. We hope that the exhibits presented here will evoke interest among Soviet specialists and that we will succeed in establishing closer, long-term cooperation in the field of exchanging technology. And the entire exhibit will serve the cause of strengthening the friendship between the peoples of Italy and the USSR." /By K. Mezentsev/ /Text/ /Kiev SEL'SKAYA ZHIZN' 19 Oct 83 p 3/ 2384

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